

636554

Report Number: 214-TRC-03-008

Safety Compliance Testing For FMVSS 214

Side Impact Protection

Indicant

**General Motors of Canada Ltd.
2004 Pontiac Grand Prix GT 4-Door Sedan**

NHTSA Number: C40100

Transportation Research Center Inc.

10820 State Route 347

P. O. Box B-67

East Liberty, OH 43319



May 5, 2003

Final Report

Test Date: April 22, 2003

**U. S. Department Of Transportation
National Highway Traffic Safety Administration**

Enforcement

Office of Vehicle Safety Compliance

400 Seventh Street, S. W.

Room No. 6111 (NVS-220)

Washington, DC 20590

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Test Performed By: Michael S. Postle, Engineering Technician

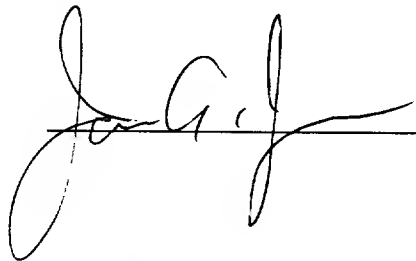
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16. Abstract <p>This 55/28 km/h 90° Impact (Moving Deformable Barrier) Compliance Test was conducted on the subject vehicle, a 2004 Pontiac Grand Prix GT 4-door sedan in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-214D-06 (except the test was conducted 8 km/h (5 mph) faster than the standard specified) to determine FMVSS 214 Side Impact Protection compliance. This test was conducted by Transportation Research Center Inc. in East Liberty, Ohio, on April 22, 2003.</p> <p>The impact velocity of the Moving Deformable Barrier (MDB) was 62.2 km/h, and the ambient temperature at the struck (driver's side) side of the target vehicle at the time of impact was 21.1° C. The target vehicle's post-test maximum crush was 418 mm at Level 2.</p> <p>The test or target vehicle's performance is given below:</p> <table border="0"> <thead> <tr> <th></th> <th>Front SID-H3</th> <th></th> <th>Rear SID-H3</th> <th></th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib Acceleration:</td> <td>71.2</td> <td>g's</td> <td>93.2</td> <td>g's</td> </tr> <tr> <td>Left Lower Rib Acceleration:</td> <td>59.4</td> <td>g's</td> <td>93.8</td> <td>g's</td> </tr> <tr> <td>Lower Spine Acceleration:</td> <td>86.1</td> <td>g's</td> <td>78.8</td> <td>g's</td> </tr> <tr> <td>Thoracic Trauma Index, (TTI):</td> <td>78.6</td> <td>g's</td> <td>86.3</td> <td>g's</td> </tr> <tr> <td>Pelvis Acceleration (PEV):</td> <td>84.3</td> <td>g's</td> <td>82.5</td> <td>g's</td> </tr> </tbody> </table> <p>The two doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during side impact event.</p>				Front SID-H3		Rear SID-H3		Left Upper Rib Acceleration:	71.2	g's	93.2	g's	Left Lower Rib Acceleration:	59.4	g's	93.8	g's	Lower Spine Acceleration:	86.1	g's	78.8	g's	Thoracic Trauma Index, (TTI):	78.6	g's	86.3	g's	Pelvis Acceleration (PEV):	84.3	g's	82.5	g's
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Section 1

Purpose and Test Procedure

This side impact test is part of the FMVSS 214 Side Impact Protection Compliance Test Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-02-D-11114. The purpose of this test was to evaluate side impact protection in a 2004 Pontiac Grand Prix GT 4-door sedan. The test was conducted in accordance with the Office of Vehicle Safety Compliance's Laboratory Test Procedure (TP-214D-06, dated July 2001) with the exception of test speed, which was at the NCAP High-Speed Lateral Impact level (61.2 km/h).

Section 2

Summary of Side Impact Test

A 2004 Pontiac Grand Prix GT 4-door sedan was impacted on the driver's side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the monorail at a velocity of 62.2 km/h (38.6 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by Transportation Research Center Inc. in East Liberty, Ohio on April 22, 2003. Pre-test and post-test photographs of the test vehicle, the moving deformable barrier (MDB), and the side impact dummies (SID-H3s) are included in Appendix A.

Two restrained Side Impact Dummies (SID-H3s) were placed in the driver (Pos. #1) and left rear (Pos. #4) designated seating positions according to the instructions specified in the OVSC Side Impact Laboratory Test Procedure (TP-214D-06, dated July 2001). Both SID-H3s were certified prior to this test. The side impact test was documented by one real-time camera and 9 high-speed cameras. Camera locations and other pertinent camera information are included in this report.

The SID-H3s were instrumented with the following accelerometers:

1. Head (HED) triaxial and redundant accelerometers (X, Y, and Z-directions)
2. Neck (NEK) triaxial force and moment load cells (X, Y, and Z-directions)
3. Left Upper Rib (LUR) uniaxial and redundant accelerometer (Y-direction)
4. Left Lower Rib (LLR) uniaxial and redundant accelerometer (Y-direction)
5. Lower Thoracic Spine (T₁₂) uniaxial and redundant accelerometer (Y-direction)
6. Pelvic (PEV) section uniaxial and redundant accelerometer (Y-direction)

A summary of the side impact Hybrid III dummy (SID-H3) configuration and verification test data can be found in Appendix C. A total of 68 channels of data were recorded. Appendix B contains the vehicle, MDB, and dummy response data traces.

The following tables summarize the results of the test:

Injury Criteria	Front SID-H3	Rear SID-H3
TTI (g)	78.6	86.3
PEV (g)	84.3	82.5

Head Injury Criteria (HIC)

Injury Criteria	Front SID-H3	Rear SID-H3
HIC	632	774
t_1 (ms)	46.4	47.5
t_2 (ms)	82.4	60.1
Average Acceleration $t_1 - t_2$ (g)	49.8	82.2

HIC is as defined in FMVSS 208. The maximum time interval t_1 to t_2 is 36 ms.

Neck Injury Criteria

Maximum Values	Front SID-H3	Rear SID-H3
Neck X-axis Force (N)	-952	358
Neck Y-axis Force (N)	1009	539
Neck Z-axis Force (N)	2693	-1519
Moment About X-axis (Nm) ¹	94.3	-152.8
Moment About Y-axis (Nm)	-31.8	-28.3
Moment About Z-axis (Nm)	23.7	-25.3

¹ Calculated about the occipital condyle with the following formula: $M_{occ} = M_x + 0.01778F_y$.

Data Acquisition Explanations

The vehicle's left lower A-post Y-axis acceleration channel, LLAYG1, exceeded full-scale at approximately 36 milliseconds and recorded no useful data after that. This affected the vehicle's left lower A-post Y-axis velocity measurement.

The vehicle's left middle A-post Y-axis acceleration channel, LMAYG1, recorded questionable data throughout the test. This affected the vehicle's left middle A-post Y-axis velocity measurement.

The vehicle's left middle B-post Y-axis acceleration channel, LMBYG1, did not return to zero. This affected the vehicle's left middle B-post Y-axis velocity measurement.

The vehicle's left lower B-post Y-axis acceleration channel, LLBYG1, did not return to zero. This affected the vehicle's left lower B-post Y-axis velocity measurement.

The moving deformable barrier's X-, Y-, and Z-axis center of gravity acceleration channels, BCGXG1, BCGYG1, and BCGZG1, recorded a data spike at approximately 264 milliseconds. This affected the moving deformable barrier's X-, Y-, and Z-axis velocity measurements and resultant acceleration calculation.

Section 3

Summary of Test Results

Data Sheet 1

General Test Vehicle Parameter Data

Test Vehicle Information:

Vehicle Year/Make/Model: 2004 Pontiac Grand Prix GT
Vehicle Body Style/Color: 4-door sedan/Silver VIN: 2G2WP522041100776
Vehicle NHTSA No.: C40100 Build Date: 02/03
Engine Data: 6 Cylinders; CID; 3.8 Liters; cc
Placement: - Longitudinal; or - Lateral; or - Horizontal
Transmission: 4 Speed; - Manual; X Automatic; - Overdrive
Final Drive: - RWD; X FWD; - Four-Wheel Drive
Odometer Reading: 81 km
Options: X A/C; X Power steering; X Pwr. brakes; X Power windows

Data From Vehicle's Tire Placard:

Tire Pressure (at capacity)* 210 kPa Front; 210 kPa Rear
Recommended Tire Size: P225/60R16
Tires on Test Vehicle: P225/60R16 Manufacturer: Goodyear, Eagle LS

Vehicle Capacity Data:

Number of Occupants: 2 Front; 3 Rear; 3rd seat; 5 Total
Type of Front Seats: X Bucket; - Bench; - Split bench
Type of Front Seat Back: - Fixed; X Adjustable with X Lever or - Knob
Vehicle Max. Capacity Loading = 416 kg (A)
No. of Occupants x 68.04 kg. = 340 kg (B)
Vehicle Cargo Capacity (A-B) = 76 kg

Test Vehicle Delivered Weight With Maximum Fluids:

Left Front	=	<u>490.0</u> kg	Left Rear	=	<u>287.0</u> kg
Right Front	=	<u>498.0</u> kg	Right Rear	=	<u>291.0</u> kg
Total Front	=	<u>988.0</u> kg	Total Rear	=	<u>578.0</u> kg
Front % of Total Weight	=	<u>63.1</u> %	Rear % of Total Weight	=	<u>36.9</u> %
Total Weight	=	<u>1566.0</u> kg			

* Tire pressure used in test.

Data Sheet 1 (continued)

General Test Vehicle Parameter Data

Calculation Of Vehicle's Target Test Weight:

Total Test Vehicle Delivered Weight With Max. Fluids = 1566 kg (A)
Maximum Cargo Carrying Capacity of Test Vehicle = 76 kg (B)
Weight of Instrumented Side Impact Dummies (2 X 84.0 kg) = 168 kg (C)
Test Vehicle Target Weight: = 1810 kg (A+B+C)

Fully Loaded Test Vehicle (UDW + 2 SID-H3s + Cargo):

Left Front	=	<u>594.0</u> kg	Left Rear	=	<u>401.0</u> kg
Right Front	=	<u>495.0</u> kg	Right Rear	=	<u>373.5</u> kg
Total Front	=	<u>1089.0</u> kg	Total Rear	=	<u>774.5</u> kg
Front % of Total Weight	=	<u>58.4</u> %	Rear % of Total Weight	=	<u>41.6</u> %
Total Weight	=	<u>1863.5</u> kg			

As Tested Weight of Test Vehicle (2 SID-H3s + Cargo + Equipment & Instrumentation):

Left Front	=	<u>544.6</u> kg	Left Rear	=	<u>364.6</u> kg
Right Front	=	<u>524.6</u> kg	Right Rear	=	<u>369.4</u> kg
Total Front	=	<u>1069.2</u> kg	Total Rear	=	<u>734.0</u> kg
Front % of Total Weight	=	<u>59.3</u> %	Rear % of Total Weight	=	<u>40.7</u> %
Total Weight	=	<u>1803.2</u> kg			

Test Vehicle Attitude (all dimensions in millimeters):

As Delivered	Fully Loaded	Ready For Test
Right Front <u>740</u>	Right Front <u>720</u>	Right Front <u>720</u>
Left Front <u>745</u>	Left Front <u>717</u>	Left Front <u>720</u>
Right Rear <u>755</u>	Right Rear <u>698</u>	Right Rear <u>701</u>
Left Rear <u>755</u>	Left Rear <u>685</u>	Left Rear <u>694</u>

Test Vehicle Wheelbase: 2806 mm

C.G. = 1142 mm rearward of front wheel centerline

Total Vehicle Length:

Right Side = 4747 mm
Left Side = 4747 mm
Centerline = 5030 mm

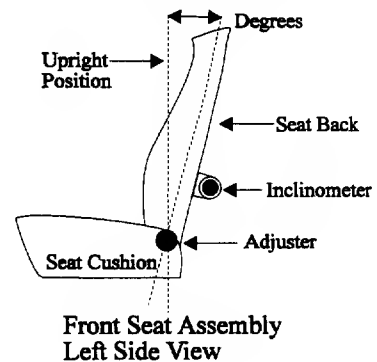
Data Sheet 1 (continued)

General Test Vehicle Parameter Data

Vehicle: 2004 Pontiac Grand Prix GT 4-door sedan

NHTSA No.: C40100

Nominal Design Riding Position for adjustable driver and passenger seat backs. Please describe how to position the inclinometer to measure the seat back angle. Include description of the location of the adjustment latch detent, if applicable.



Front Seat Cushion Placement: 120 mm forward of full rear

Total Length of Fore/Aft Adjustment Travel: 240 mm

Total Number of Adjustment Positions or Detents: N/A, power

Front Seat Back Adjustment Position: The back was adjusted to 23.6° measured at the upper 1/3 of the seat back frame.

Seat Back Torso Angle: 23.6 degrees

Second Position Seat Placement: Fixed

Total Length Of Fore/Aft Adjustment Travel: N/A mm

Seat Back Adjustment Position: N/A, not adjustable

Adjustable Steering Column Position: 22.5°, 4th notch down from full tilt up position (not over-travel position)

Window Positions:

Right Front: Open

Right Rear: Open

Left Front: Closed

Left Rear: Closed

Note: Windows will be in closed position on struck side of test vehicle and in open position on opposite side.

Amount of Stoddard Solvent In Fuel Tank:

64.0 liters (fuel tank usable capacity)

60.1 liters used in test (92% - 94% of fuel tank usable capacity)

Location of Impact Point On Test Vehicle Side To Be Impacted:

Wheelbase = 2806 millimeters

Intended impact point is 463 millimeters rearward of front axle centerline
(which is 940 millimeters forward of the wheelbase midpoint)

Actual Impact Point is 474 millimeters rearward of front axle centerline

Data Sheet 2

Test Vehicle Summary of Results

Vehicle Year/Make/Model: 2004/Pontiac/Grand Prix GT

Body Style: 4-door sedan

VIN: 2G2WP522041100776

NHTSA No.: C40100

Build Date: 02/03

Test Date: 04/22/03

Vehicle Overall Length = 5030 mm

Overall Width = 1817 mm

Vehicle Test Weight (Pre-Test):

Left Front = 544.6 kg Left Rear = 364.6 kg

Right Front = 524.6 kg Right Rear = 369.4 kg

Total Front = 1069.2 kg Total Rear = 734.0 kg

Total Weight = 1803.2 kg

Wheelbase = 2806 mm

Longitudinal C.G. From Center Of Front Axle = 1142 mm

Impact Angle With Respect To Impactor = 90 degrees

Impact Point:

Actual Impact Point is 11 mm right of nominal impact ref. line (Lateral)

Actual Impact Point is 10 mm up from nominal impact point (Vertical)

Maximum Exterior Static Crush:

1. Level 1 (242 mm above ground) = 48 mm

2. Level 2 (524 mm above ground) = 418 mm

3. Level 3 (616 mm above ground) = 383 mm

4. Level 4 (882 mm above ground) = 355 mm

5. Level 5 (1362 mm above ground) = 118 mm

Maximum Post-Test Intrusion = 418 mm

Occupants:

Front Passenger

Rear Passenger

Dummy Identification 065

066

Restraints Used Seat belt

Seat belt

Instrumentation:

Number of Vehicle Data Channels: = 21

Number of Cameras: Onboard = 3 Offboard = 8 Total = 11

Data Sheet 3

Moving Deformable Barrier (MDB) Summary

MDB Face Manufacturer And Serial Number:

Plascore, 017A0303-4 13C0203

Position Of Impactor (MDB) On Monorail:

Crabbed 27°

MDB Specifications:

Overall Width of Framework Carriage	=	<u>1251</u>	mm
Overall Length of MDB (Incl. honeycomb impact face)	=	<u>4014</u>	mm
Wheelbase of Framework Carriage	=	<u>2591</u>	mm
Track of Framework Carriage (Front & Rear)	=	<u>1881</u>	mm
C.G. Location Rearward of Front Axle	=	<u>1115</u>	mm

MDB Weight:

Left Front	=	<u>385.8</u>	kg	Left Rear	=	<u>296.6</u>	kg
Right Front	=	<u>389.6</u>	kg	Right Rear	=	<u>289.0</u>	kg
Total Front	=	<u>775.4</u>	kg	Total Rear	=	<u>585.6</u>	kg
Total MDB Weight	=	<u>1361.0</u>	kg				
Impact Angle (MDB C/L to Target Vehicle C/L)	=	<u>90</u>	degrees				
Impact Speed	=	<u>62.2</u>	km/h				

Maximum Static Crush of Honeycomb Impact Face:

1. Row A at Center of Bumper Level	=	<u>N/A¹</u>	millimeters
2. Row B at Top of Bumper Level	=	<u>63</u>	millimeters
3. Row C at Mid Level	=	<u>91</u>	millimeters
4. Row D at Top of Stack Level	=	<u>143</u>	millimeters

Instrumentation:

Number of MDB Data Channels = 5

¹ Measurement point could not be located.

Data Sheet 4

Post-Test Observations

Vehicle: 2004 Pontiac Grand Prix GT 4-door sedan

NHTSA No.: C40100

Visible Dummy Contact Points:

	<u>Left Front SID-H3</u>	<u>Left Rear SID-H3</u>
Head:	<u>Top of door panel, shoulder</u>	<u>C-pillar, head restraint</u>
Upper Torso:	<u>Door panel</u>	<u>Door panel</u>
Lower Torso:	<u>Door panel</u>	<u>Door panel</u>
Left Knee:	<u>Door panel</u>	<u>Door panel</u>
Right Knee:	<u>None</u>	<u>None</u>

Door Opening:

	<u>Left Side</u>	<u>Right Side</u>
Front:	<u>Jammed and latched</u>	<u>Easy</u>
Rear:	<u>Jammed and latched</u>	<u>Easy</u>

MDB Distance From Target Impact Point:

Vertical: 10 mm up from target
Horizontal: 11 mm right from target

Arm Rest Locations:

Front: 264 mm below the bottom of the window
Rear: 343 mm below the bottom of the window

Seat Movement:

Front: None
Rear: None

Glazing Damage:

Windshield: Broken at top of driver's A-pillar
Window: Driver and passenger side windows broken. Vehicle rear window broken.

Pillar Separation: No

Sill Separation: No

Other Notable Impact Effects:

The bumper element of the impactor face separated during impact.

Section 4

Occupant and Vehicle Information

Data Sheet 5

SID-H3 Instrumentation Data

Vehicle: 2004 Pontiac Grand Prix GT 4-door sedan

NHTSA No.: C40100

TEST NUMBER: 030422-1

DRIVER DUMMY SERIAL NUMBER: 065

POSITIVE
DIRECTION

NEGATIVE
DIRECTION

HEAD ACCELERATION

LONGITUDINAL	8.9 g	@ 249.6 ms	35.9 g	@ 77.0 ms
LATERAL	49.0 g	@ 77.1 ms	6.9 g	@ 181.9 ms
VERTICAL	62.4 g	@ 51.0 ms	0.6 g	@ 17.4 ms
RESULTANT	67.9 g	@ 51.0 ms		
HIC	632	from 46.4 to 82.4 ms		

HEAD REDUNDANT ACCELERATION

LONGITUDINAL	9.0 g	@ 251.0 ms	35.0 g	@ 77.0 ms
LATERAL	50.1 g	@ 77.1 ms	7.2 g	@ 35.2 ms
VERTICAL	66.4 g	@ 50.9 ms	0.5 g	@ 17.4 ms
RESULTANT	72.8 g	@ 50.9 ms		
HIC	685	from 46.0 to 82.0 ms		

NECK FORCE

X-AXIS SHEAR	117.6 N	@ 198.3 ms	952.1 N	@ 76.7 ms
Y-AXIS SHEAR	1008.7 N	@ 79.2 ms	275.6 N	@ 31.7 ms
Z-AXIS AXIAL	2693.4 N	@ 55.1 ms	580.0 N	@ 307.0 ms

NECK MOMENT

ABOUT X-AXIS	81.2 N-m	@ 72.1 ms	101.7 N-m	@ 44.1 ms
ABOUT Y-AXIS	18.4 N-m	@ 84.8 ms	31.8 N-m	@ 48.6 ms
ABOUT Z-AXIS	23.7 N-m	@ 75.8 ms	13.9 N-m	@ 43.4 ms
OCC COND ABOUT X	94.3 N-m	@ 72.0 ms	90.2 N-m	@ 43.4 ms

LEFT UPPER RIB ACCELERATION

LATERAL (P)	71.2 g	@ 33.7 ms	32.6 g	@ 69.4 ms
LATERAL (R)	70.9 g	@ 33.7 ms	33.8 g	@ 69.4 ms

LEFT LOWER RIB ACCELERATION

LATERAL (P)	59.4 g	@ 31.9 ms	19.8 g	@ 73.8 ms
LATERAL (R)	59.8 g	@ 31.9 ms	19.9 g	@ 73.8 ms
TTI d (P)	78.6			
TTI d (R)	77.6			

LOWER SPINE ACCELERATION

LATERAL (P)	86.1 g	@ 32.5 ms	18.6 g	@ 65.0 ms
LATERAL (R)	84.4 g	@ 32.5 ms	19.2 g	@ 64.4 ms

PELVIS ACCELERATION

LATERAL (P)	84.3 g	@ 30.0 ms	22.6 g	@ 54.4 ms
LATERAL (R)	84.4 g	@ 30.0 ms	22.6 g	@ 54.4 ms

POSITIVE DIRECTION

LONGITUDINAL: FORWARD
LATERAL: RIGHTWARD
VERTICAL: DOWNWARD

NEGATIVE DIRECTION

LONGITUDINAL: REARWARD
LATERAL: LEFTWARD
VERTICAL: UPWARD

Data Sheet 5 (Continued)

SID-H3 Instrumentation Data

Vehicle: 2004 Pontiac Grand Prix GT 4-door sedan

NHTSA No.: C40100

TEST NUMBER: 030422-1

PASSENGER DUMMY SERIAL NUMBER: 066

POSITIVE
DIRECTION

NEGATIVE
DIRECTION

HEAD ACCELERATION

LONGITUDINAL	5.5 g	@ 50.8 ms	19.6 g	@ 56.1 ms
LATERAL	106.7 g	@ 55.4 ms	9.5 g	@ 183.1 ms
VERTICAL	21.1 g	@ 41.1 ms	45.0 g	@ 53.9 ms
RESULTANT	114.1 g	@ 55.4 ms		
HIC	774 from 47.5 to 60.1 ms			

HEAD REDUNDANT ACCELERATION

LONGITUDINAL	5.4 g	@ 50.7 ms	19.7 g	@ 55.5 ms
LATERAL	106.2 g	@ 55.4 ms	9.5 g	@ 182.3 ms
VERTICAL	20.4 g	@ 39.6 ms	45.9 g	@ 53.9 ms
RESULTANT	114.5 g	@ 55.4 ms		
HIC	759 from 47.5 to 60.0 ms			

NECK FORCE

X-AXIS SHEAR	357.6 N	@ 60.0 ms	246.9 N	@ 76.3 ms
Y-AXIS SHEAR	538.5 N	@ 55.4 ms	262.8 N	@ 40.9 ms
Z-AXIS AXIAL	869.5 N	@ 39.6 ms	1518.6 N	@ 58.6 ms

NECK MOMENT

ABOUT X-AXIS	28.1 N-m	@ 97.4 ms	161.8 N-m	@ 56.2 ms
ABOUT Y-AXIS	28.2 N-m	@ 98.7 ms	28.3 N-m	@ 49.7 ms
ABOUT Z-AXIS	6.0 N-m	@ 103.6 ms	25.3 N-m	@ 58.4 ms
OCC COND ABOUT X	32.3 N-m	@ 97.5 ms	152.8 N-m	@ 56.2 ms

LEFT UPPER RIB ACCELERATION

LATERAL (P)	93.2 g	@ 40.0 ms	7.4 g	@ 136.3 ms
LATERAL (R)	91.2 g	@ 40.0 ms	7.3 g	@ 136.3 ms

LEFT LOWER RIB ACCELERATION

LATERAL (P)	93.8 g	@ 38.8 ms	17.7 g	@ 73.1 ms
LATERAL (R)	91.5 g	@ 38.8 ms	18.3 g	@ 73.1 ms
TTI d (P)	86.3			
TTI d (R)	84.1			

LOWER SPINE ACCELERATION

LATERAL (P)	78.8 g	@ 41.2 ms	44.5 g	@ 67.5 ms
LATERAL (R)	76.7 g	@ 40.6 ms	44.0 g	@ 67.5 ms

PELVIS ACCELERATION

LATERAL (P)	82.5 g	@ 30.6 ms	24.8 g	@ 66.9 ms
LATERAL (R)	82.0 g	@ 30.6 ms	24.6 g	@ 66.9 ms

POSITIVE DIRECTION

LONGITUDINAL: FORWARD
LATERAL: RIGHTWARD
VERTICAL: DOWNWARD

NEGATIVE DIRECTION

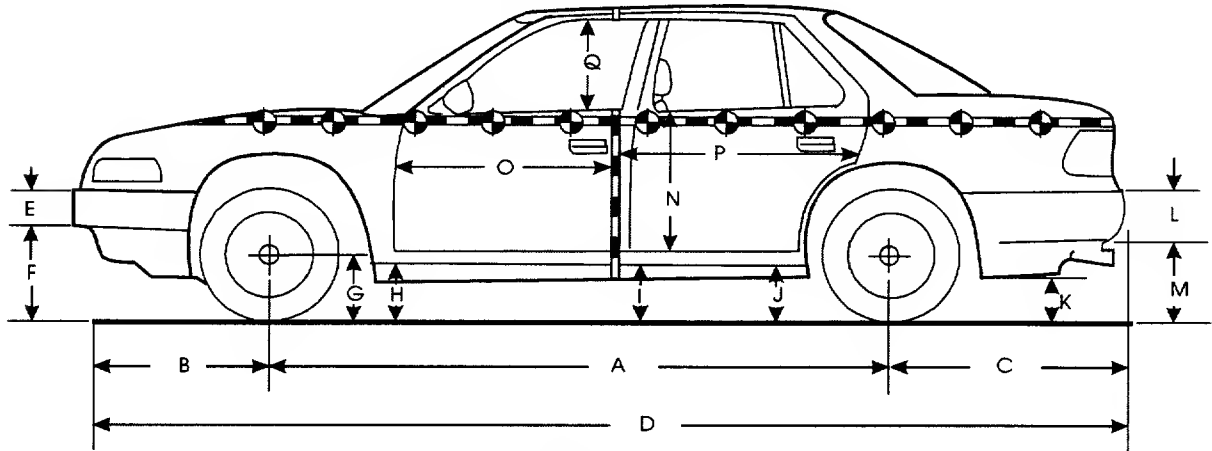
LONGITUDINAL: REARWARD
LATERAL: LEFTWARD
VERTICAL: UPWARD

Data Sheet 6

Vehicle Pre-Test And Post-Test Measurements

Vehicle: 2004 Pontiac Grand Prix GT 4-door sedan

NHTSA No.: C40100



Left Side View

Note: All dimensions are in millimeters with tolerance of ± 3 mm

	Pre-Test (as delivered)	Pre-Test (as tested)	Post-Test (as tested)	Change
A	2806	2806	2750	56
B	1104	1104	1115	-11
C	1120	1120	1120	0
D	5030	5030	5030	0
E	200	200	200	0
F	364	357	368	-11
G	312	314	316	-2
H	216	190	198	-8
I	235	196	209	-13
J1	210	170	192	-22
J2	230	187	185	2
K	248	194	197	-3
L	155	155	155	0
M	442	363	380	-17
N	730	730	595	135
O	830	830	720	110
P	1338	1338	1180	158
Q	401	401	394	7
R	4747	4747	4746	1
S	4747	4747	4700	47
T	1365	1365	1135	230

D = Length at centerline
T = Width at B-pillar

E&L = Bumper Thickness
J1 = To Pinch Weld

R = Right Side Length
J2 = To Sill

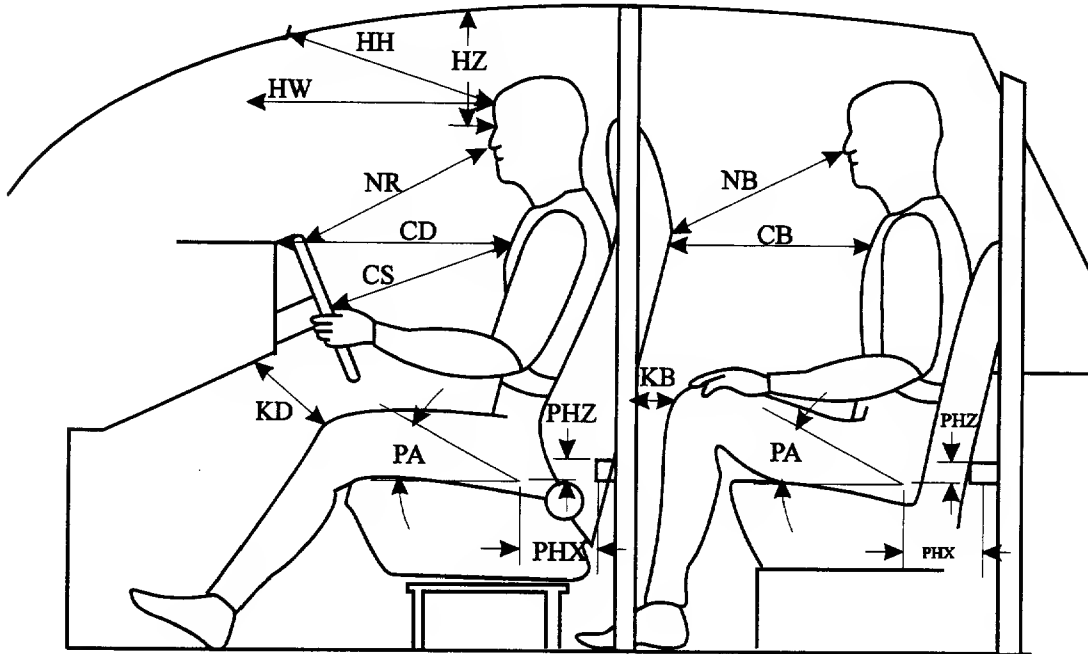
S = Left Side Length

Data Sheet 7

SID-H3 Longitudinal Clearance Dimensions

Vehicle: 2004 Pontiac Grand Prix GT 4-door sedan

NHTSA No.: C40100



Left Side View

Note: All measurements are in millimeters with tolerance of ± 3 mm

Measurement	Driver SID-H3 # 065	Left Rear Pass. SID-H3 # 066
HH	335	N/A
HW	573	N/A
HZ	168	145
NR/NB	410	631
CD/CB	541	528
CS	318	N/A
KDL(KDA°)/KBL(KBA°)	99/(62°)	133/(60.7°)
KDR(KDA°)/KBR(KBA°)	108/(60.6°)	128/(59.1°)
PA°	23.8°	23.2°
PHX	176	261
PHZ	110	367

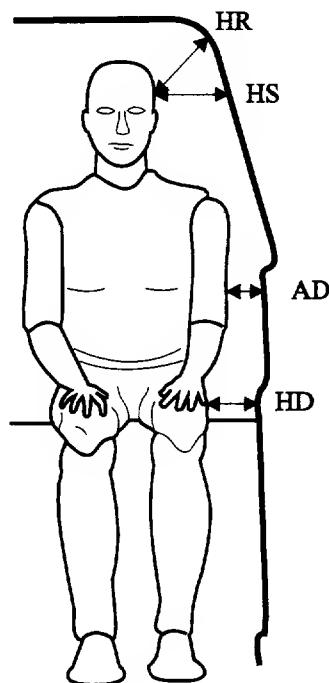
Note: 2-door vehicle shown. Rear dummy PHX and PHZ measurements for 4-door sedan vehicle would use the C-post striker as a reference point.

Data Sheet 8

SID-H3 Lateral Clearance Dimensions

Vehicle: 2004 Pontiac Grand Prix GT 4-door sedan

NHTSA No.: C40100



Note: All measurements are in millimeters with tolerance of ± 3 mm

Measurement	Driver SID-H3 # 065	Left Rear Pass. SID-H3 # 066
HR	187	180
HS	340	266
AD*	Lower: 127 Upper: 132	Lower: 119 Upper: 88
HD	139	177

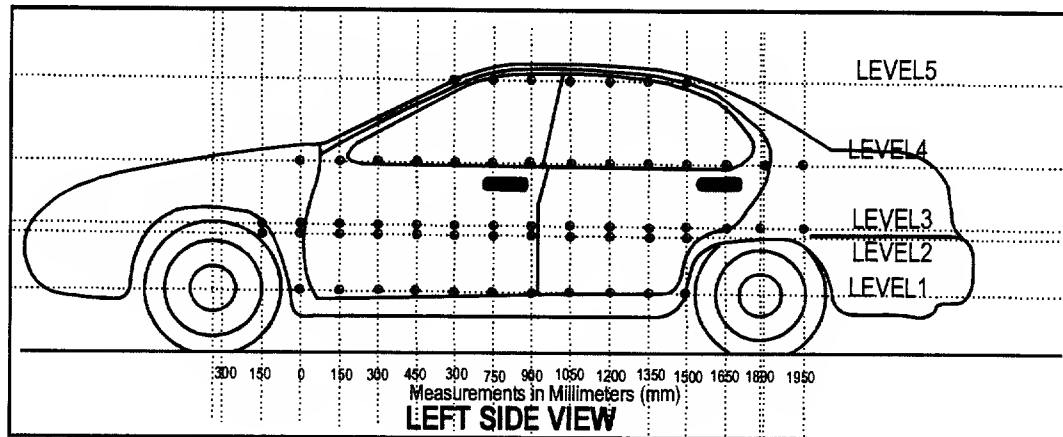
- * Lower measurement is taken laterally at center of the lower rib accelerometer height from the SID-H3 arm segment to the closest part of the vehicle side.
Upper measurement is taken laterally at center of the upper rib accelerometer height from the SID-H3 arm segment to the closest part of the vehicle side.

Data Sheet 9

Vehicle Side Measurements

Vehicle: 2004 Pontiac Grand Prix GT 4-door sedan

NHTSA No.: C40100



Level 5 - Window Top

Level 4 - Window Sill

Level 3 - Mid-Door

Level 2 - Occupant H-Point

Level 1 - Axle Centerline Height or Sill Top Height

Measurements Are Taken When The Vehicle Is In The "As Tested" Configuration.

Measurements along the vertical 750 mm line shown above:

Level 5 @ Window Top	=	<u>1362</u>	mm
Level 4 @ Window Sill	=	<u>882</u>	mm
Level 3 @ Mid Door	=	<u>616</u>	mm
Level 2 @ Occupant H-Point	=	<u>524</u>	mm
Level 1 @ Axle Centerline Height (or Sill Top Height)	=	<u>242</u>	mm

Data Sheet 10

Vehicle Exterior Crush Profiles - All Levels

Vehicle: 2004 Pontiac Grand Prix GT 4-door sedan

NHTSA No.: C40100

Location	Height		(mm) From Impact Point													
			-1200	-1050	-900	-750	-600	-450	-300	-150	0	150	300	450	600	750
Level 1 Side Sill	242	Pre	---	---	---	---	---	---	---	---	636	628	620	618	616	613
		Post	---	---	---	---	---	---	---	---	684	675	668	660	658	655
		Crush	---	---	---	---	---	---	---	---	48	47	48	42	42	42
Level 2 H-Point	524	Pre	667	645	616	---	---	---	---	---	597	596	597	596	595	595
		Post	670	650	628	---	---	---	---	---	644	864	920	952	971	991
		Crush	3	5	12	---	---	---	---	---	47	268	323	356	376	396
Level 3 Mid-Door	616	Pre	690	654	628	592	---	---	---	585	595	594	594	592	592	590
		Post	696	662	641	613	---	---	---	635	643	846	880	948	970	924
		Crush	6	8	13	21	---	---	---	50	48	252	286	356	378	334
Level 4 Window Sill	882	Pre	---	---	725	700	680	660	650	640	630	630	624	620	619	615
		Post	---	---	735	713	700	690	685	680	682	786	835	896	923	933
		Crush	---	---	10	13	20	30	35	40	52	156	211	276	304	318
Level 5 Window Top	1362	Pre	---	---	---	---	---	---	---	---	---	---	---	---	---	895
		Post	---	---	---	---	---	---	---	---	---	---	---	---	---	968
		Crush	---	---	---	---	---	---	---	---	---	---	---	---	---	73

Data Sheet 10 (Continued)

Vehicle Exterior Crush Profiles - All Levels

Vehicle: 2004 Pontiac Grand Prix GT 4-door sedan

NHTSA No.: C40100

Location	Height		(mm) From Impact Point												
			900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2400	2550	2700
Level 1 Side Sill	242	Pre	615	624	624	628	628	633	640	---	---	---	---	---	---
		Post	651	646	644	642	638	639	642	---	---	---	---	---	---
		Crush	36	22	20	14	10	6	2	---	---	---	---	---	---
Level 2 H-Point	524	Pre	595	602	604	605	606	609	607	596	---	---	---	---	623
		Post	1001	1010	1012	1023	1020	995	935	670	---	---	---	---	640
		Crush	406	408	408	418	414	386	328	74	---	---	---	---	17
Level 3 Mid-Door	616	Pre	591	598	598	599	602	603	605	597	---	---	---	---	616
		Post	943	953	981	973	980	962	952	880	---	---	---	---	634
		Crush	352	355	383	374	378	359	347	283	---	---	---	---	18
Level 4 Window Sill	882	Pre	610	615	616	615	614	617	618	618	624	628	634	643	659
		Post	934	941	940	958	969	968	934	806	704	673	665	660	660
		Crush	324	326	324	343	355	351	316	188	80	45	31	17	1
Level 5 Window Top	1362	Pre	895	898	895	900	902	914	922	---	---	---	---	---	---
		Post	984	1004	1013	1010	986	970	964	---	---	---	---	---	---
		Crush	89	106	118	110	84	56	42	---	---	---	---	---	---

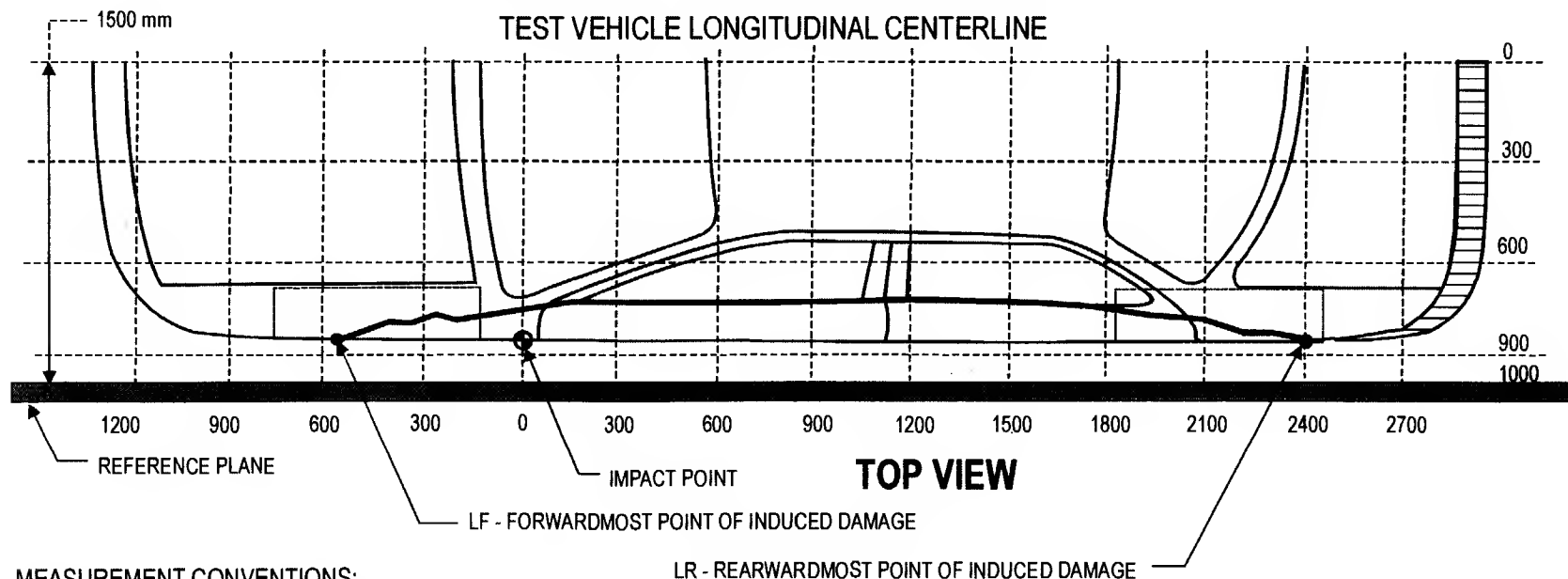
Data Sheet 11

Vehicle Damage Profile Distances

Vehicle: 2004 Pontiac Grand Prix GT 4-door sedan

NHTSA No.: C40100

NOTE: All measurements are in millimeters (mm) and should be accurate to plus or minus 3mm.



MEASUREMENT CONVENTIONS:

Forward of the impact point (towards front of vehicle) is considered negative (-)

Rearward of the impact point (towards rear end of vehicle) is considered positive (+)

DPD Measurements	Post-Test (mm)	Pre-Test (mm)	Static Crush (mm)
6: LF = 0 mm (Level 4)	682	630	52
5: ¹ 450 mm (Level 2,3)	952, 948	596, 592	356, 356
4: 750 mm (Level 2)	991	595	396
3: 1200 mm (Level 2)	1012	604	408
2: 1500 mm (Level 2)	1020	606	414
1: LR = 1950 mm (Level 3)	880	597	283

Full length of induced damage was 0 to 1950 mm.

¹ Level 2 and 3 had identical damage profile distances at 450 mm.

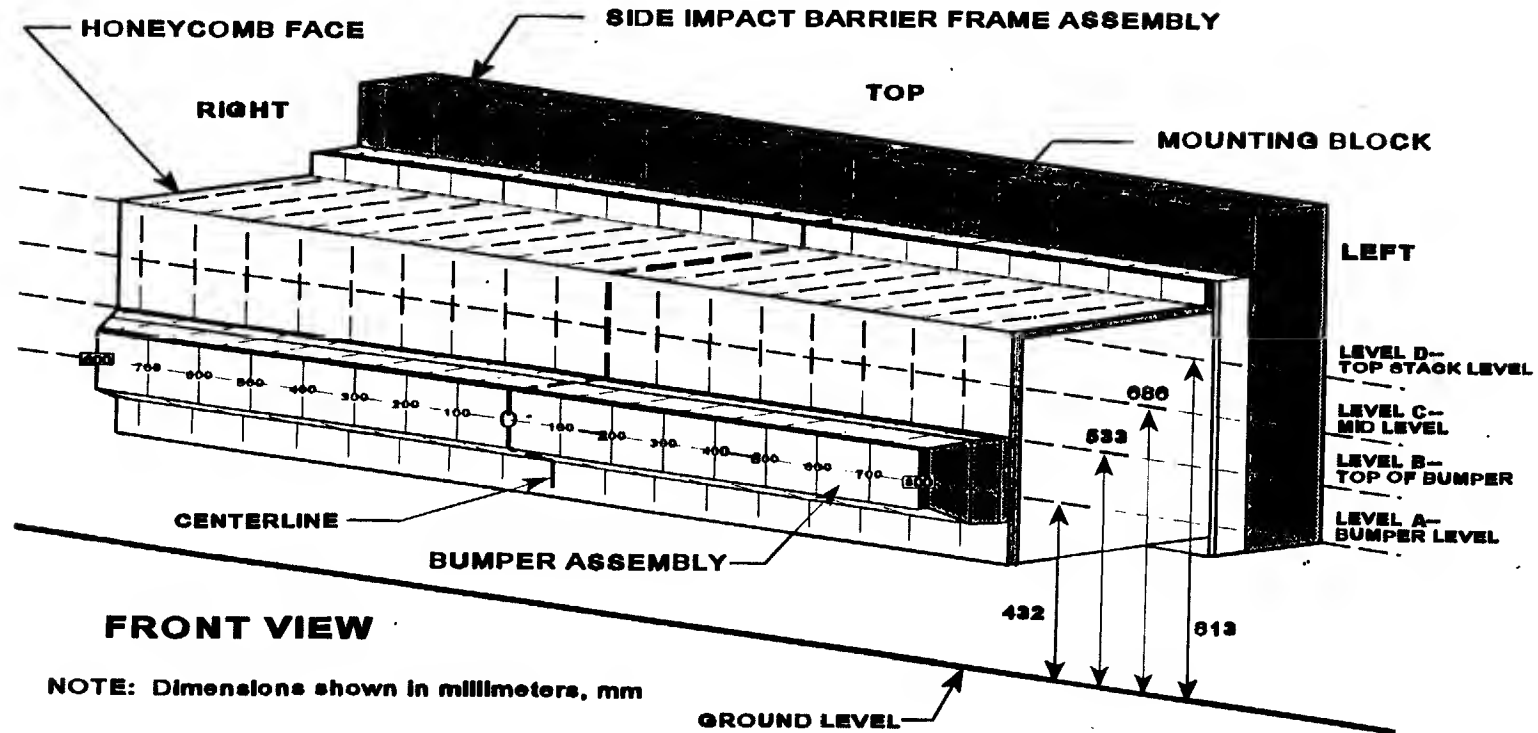
Data Sheet 12

Exterior Static Crush For Impactor Face

(Grid as looking at MDB from front)

Vehicle: 2004 Pontiac Grand Prix GT 4-door sedan

NHTSA No.: C40100



Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2004 Pontiac Grand Prix GT 4-door sedan

NHTSA No.: C40100

		Distance Right of Center (mm)										Distance Left of Center (mm)							
Location	Height At CL	800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800	
Top Stack Level - Level D	815	-36	-6	3	7	5	-2	-18	-18	-15	-15	-12	-14	-20	-28	-64	-106	-143	
Mid Level Level C	686	-24	4	8	8	4	3	-3	-8	0	-1	0	-3	-7	-12	-20	-46	-91	
Top Bumper Level - Level B	560	-20	-8	8	15	14	4	10	9	5	2	-2	-7	-14	-22	-32	-48	-63	
Mid Bumper Level - Level A	432	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

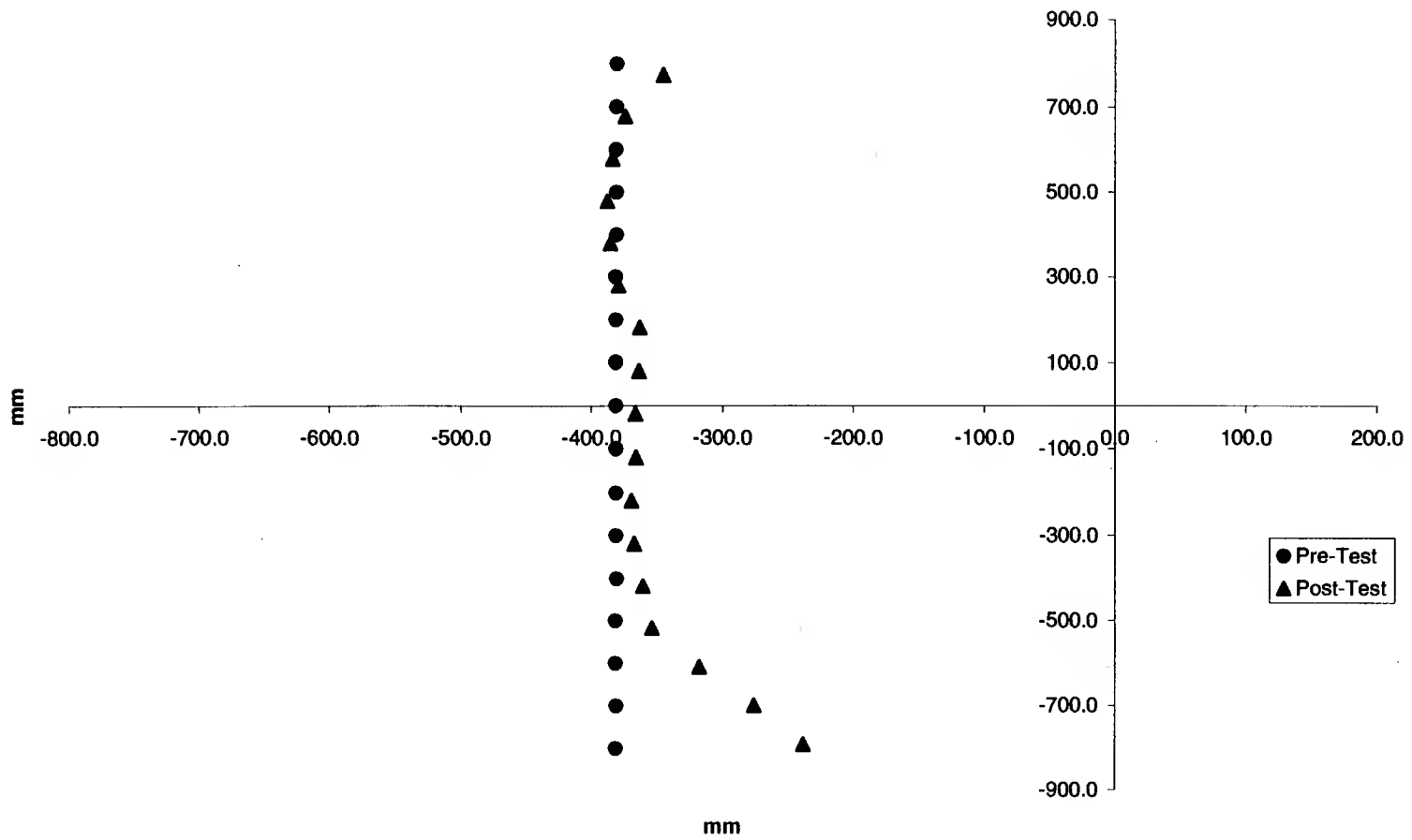
All measurements are in millimeters and have a tolerance of ± 3 mm.

Data Sheet 12 (Continued)
Exterior Static Crush For Impactor Face

Vehicle: 2004 Pontiac Grand Prix GT 4-door sedan

NHTSA No.: C40100

Level D - Deformable Barrier Face Profile 1-17



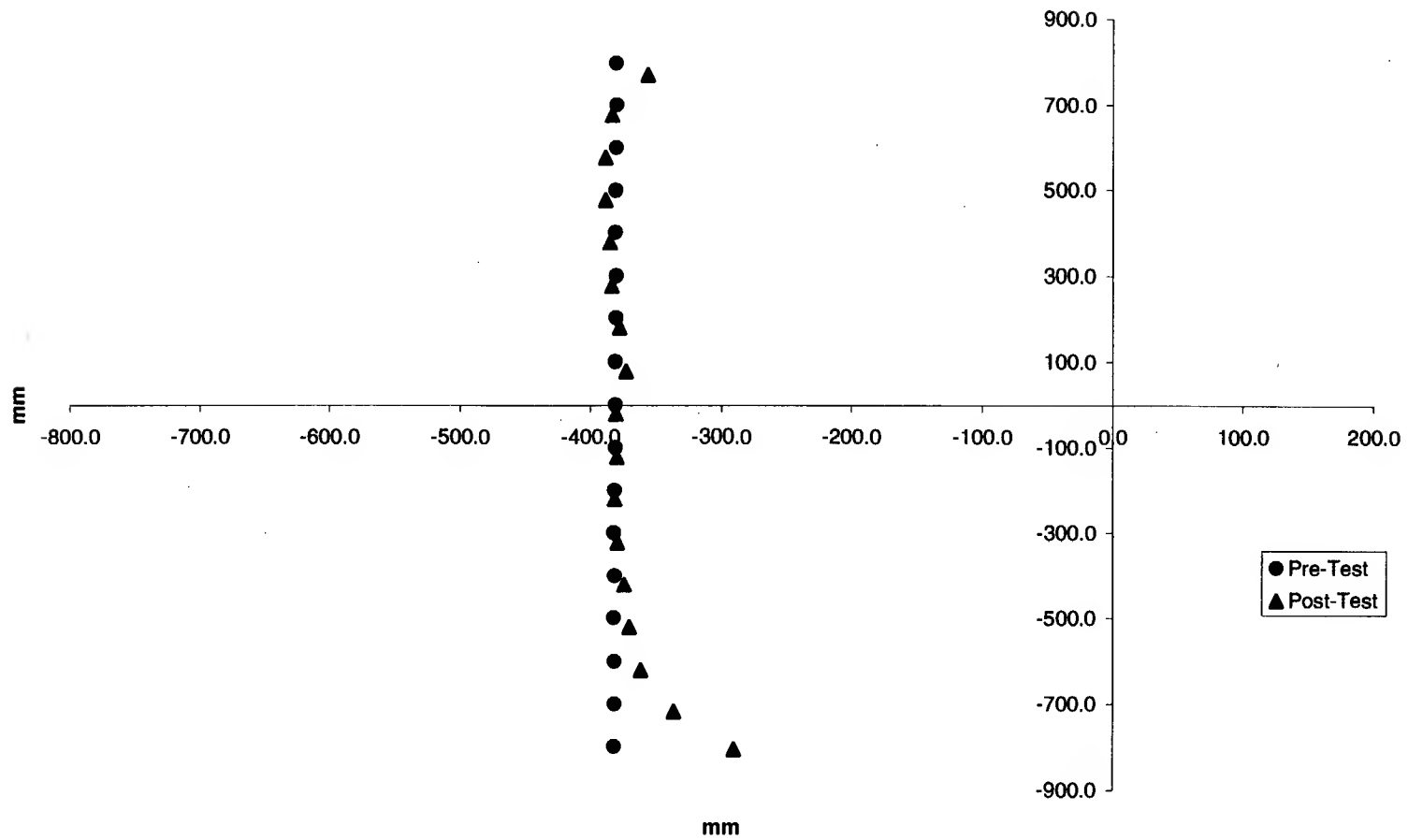
Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2004 Pontiac Grand Prix GT 4-door sedan

NHTSA No.: C40100

Level C - Deformable Barrier Face Profile 18-34



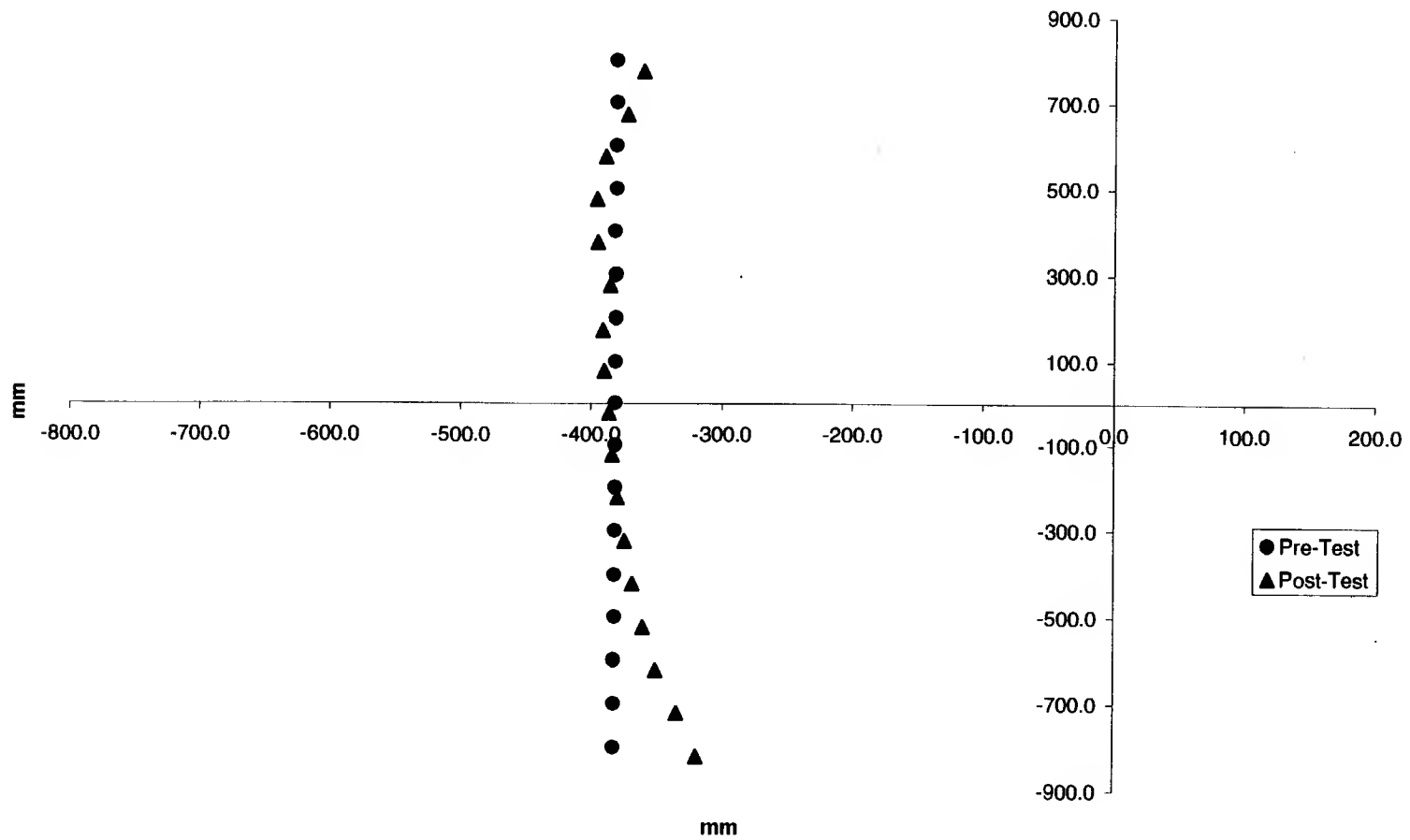
Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2004 Pontiac Grand Prix GT 4-door sedan

NHTSA No.: C40100

Level B - Deformable Barrier Face Profile 35-51



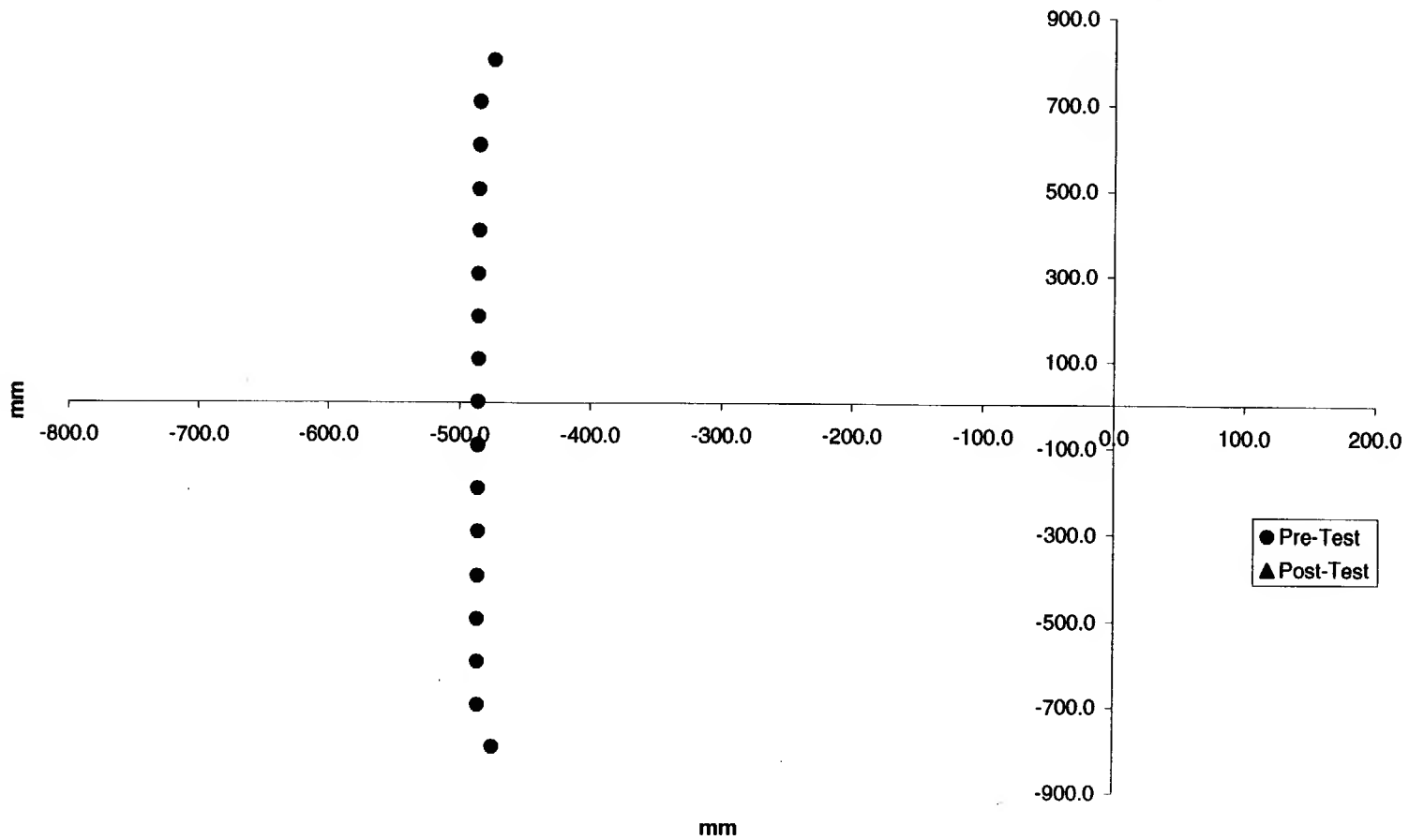
Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2004 Pontiac Grand Prix GT 4-door sedan

NHTSA No.: C40100

Level A - Deformable Barrier Face Profile 52-68



Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2004 Pontiac Grand Prix GT 4-door sedan

NHTSA No.: C40100

Deformable Barrier Face Profile

Level D - Top Stack

Pre-Test

Index	Xmm	Ymm	Zmm
1	-379.9	799.9	-39.4
2	-380.2	699.8	-40.0
3	-380.6	599.6	-40.3
4	-380.5	499.2	-40.5
5	-380.4	399.6	-40.8
6	-380.9	300.1	-41.6
7	-381.1	199.8	-41.6
8	-381.0	100.2	-42.0
9	-380.9	-0.3	-41.9
10	-381.1	-100.8	-42.4
11	-381.2	-200.4	-42.8
12	-381.5	-300.5	-43.3
13	-381.0	-400.6	-43.6
14	-381.6	-500.8	-44.6
15	-381.7	-600.6	-44.6
16	-381.4	-701.2	-45.0
17	-381.6	-800.4	-44.5

Post-Test

Index	Xmm	Ymm	Zmm
1	-344.4	773.2	-49.9
2	-373.8	678.0	-45.5
3	-383.5	578.9	-42.5
4	-387.7	478.4	-39.9
5	-385.3	378.8	-39.4
6	-379.0	279.3	-38.3
7	-362.7	180.3	-38.1
8	-363.4	80.5	-36.7
9	-366.3	-19.3	-34.1
10	-365.9	-119.4	-33.7
11	-369.2	-219.0	-31.3
12	-367.2	-318.7	-29.8
13	-360.7	-419.0	-28.5
14	-354.0	-517.9	-26.1
15	-317.3	-609.5	-33.1
16	-275.6	-700.1	-42.9
17	-238.7	-791.9	-44.9

Difference

Index	Xmm	Ymm	Zmm
1	-35.5	26.7	10.6
2	-6.4	21.8	5.5
3	3.0	20.8	2.2
4	7.2	20.8	-0.5
5	4.9	20.7	-1.3
6	-1.8	20.7	-3.3
7	-18.3	19.5	-3.5
8	-17.6	19.7	-5.3
9	-14.6	19.0	-7.8
10	-15.2	18.7	-8.7
11	-11.9	18.6	-11.5
12	-14.3	18.2	-13.5
13	-20.3	18.3	-15.1
14	-27.6	17.1	-18.5
15	-64.4	9.0	-11.5
16	-105.8	-1.0	-2.0
17	-142.9	-8.5	0.4

Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2004 Pontiac Grand Prix GT 4-door sedan

NHTSA No.: C40100

Deformable Barrier Face Profile Cont'd.

Level C - Mid Level

Pre-Test

Index	Xmm	Ymm	Zmm
18	-379.8	798.7	-169.2
19	-379.6	699.6	-169.2
20	-380.0	599.6	-169.7
21	-380.5	499.5	-170.1
22	-380.6	400.5	-171.0
23	-380.1	299.5	-170.5
24	-380.4	200.5	-170.9
25	-380.7	100.0	-171.4
26	-380.7	0.4	-171.4
27	-380.7	-100.0	-172.4
28	-381.3	-200.0	-172.8
29	-382.1	-299.9	-173.1
30	-381.4	-400.0	-173.6
31	-382.0	-499.7	-173.6
32	-381.3	-599.7	-173.5
33	-381.9	-700.0	-174.3
34	-382.0	-800.4	-174.7

Post-Test

Index	Xmm	Ymm	Zmm
18	-355.5	770.0	-173.7
19	-383.2	675.3	-173.8
20	-388.1	576.1	-170.5
21	-388.1	475.9	-169.3
22	-384.8	377.2	-168.6
23	-383.5	276.5	-166.2
24	-377.2	177.9	-165.0
25	-372.4	78.2	-166.1
26	-380.3	-21.0	-162.9
27	-379.8	-121.4	-162.0
28	-381.2	-221.3	-159.8
29	-379.3	-322.4	-158.5
30	-374.0	-421.2	-156.4
31	-370.4	-521.0	-154.4
32	-361.1	-620.4	-152.5
33	-336.0	-717.1	-153.6
34	-290.8	-807.3	-163.7

Difference

Index	Xmm	Ymm	Zmm
18	-24.4	28.7	4.5
19	3.6	24.2	4.6
20	8.1	23.5	0.8
21	7.6	23.6	-0.8
22	4.1	23.3	-2.4
23	3.4	23.1	-4.3
24	-3.2	22.6	-5.9
25	-8.4	21.8	-5.3
26	-0.4	21.4	-8.5
27	-1.0	21.4	-10.4
28	-0.1	21.3	-12.9
29	-2.8	22.5	-14.5
30	-7.4	21.1	-17.2
31	-11.6	21.3	-19.2
32	-20.3	20.7	-21.0
33	-45.9	17.2	-20.8
34	-91.2	7.0	-11.0

Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2004 Pontiac Grand Prix GT 4-door sedan

NHTSA No.: C40100

Deformable Barrier Face Profile Cont'd.

Level B - Top of Bumper

Pre-Test

Index	Xmm	Ymm	Zmm
35	-380.2	800.1	-294.9
36	-380.1	700.9	-296.0
37	-380.6	600.2	-295.8
38	-380.3	500.3	-295.9
39	-381.5	400.8	-296.6
40	-380.8	300.6	-296.3
41	-380.6	200.5	-296.6
42	-381.1	100.0	-297.4
43	-380.9	0.4	-297.6
44	-381.1	-99.3	-298.3
45	-381.1	-199.5	-298.8
46	-380.9	-299.5	-299.1
47	-381.5	-399.7	-299.4
48	-381.3	-499.4	-300.8
49	-381.9	-599.4	-301.0
50	-381.8	-699.2	-300.5
51	-382.3	-800.7	-301.2

Post-Test

Index	Xmm	Ymm	Zmm
35	-360.0	772.2	-289.7
36	-371.8	672.7	-297.8
37	-388.7	574.7	-291.0
38	-395.4	475.2	-294.9
39	-395.1	375.1	-291.8
40	-385.2	275.8	-286.1
41	-390.8	171.9	-288.0
42	-389.7	76.2	-288.2
43	-385.9	-24.0	-284.1
44	-383.5	-123.8	-285.9
45	-379.4	-224.4	-284.1
46	-373.6	-323.2	-281.2
47	-367.9	-422.8	-280.2
48	-359.5	-523.4	-277.3
49	-350.0	-622.7	-273.6
50	-334.1	-721.7	-268.8
51	-319.0	-822.2	-269.2

Difference

Index	Xmm	Ymm	Zmm
35	-20.2	27.9	-5.2
36	-8.3	28.3	1.9
37	8.1	25.5	-4.7
38	15.0	25.1	-1.0
39	13.7	25.6	-4.8
40	4.4	24.8	-10.2
41	10.2	28.6	-8.6
42	8.6	23.8	-9.2
43	5.0	24.5	-13.5
44	2.4	24.6	-12.5
45	-1.7	25.0	-14.8
46	-7.3	23.8	-17.9
47	-13.6	23.2	-19.2
48	-21.7	24.1	-23.5
49	-31.9	23.3	-27.4
50	-47.7	22.5	-31.7
51	-63.3	21.5	-32.0

Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2004 Pontiac Grand Prix GT 4-door sedan

NHTSA No.: C40100

Deformable Barrier Face Profile Cont'd.

Level A - Mid Bumper

Pre-Test			
Index	Xmm	Ymm	Zmm
52	-474.0	799.3	-420.2
53	-484.5	701.8	-422.3
54	-484.9	601.8	-423.0
55	-485.1	500.8	-423.5
56	-485.3	401.8	-423.1
57	-485.4	301.5	-424.1
58	-485.6	202.2	-424.8
59	-485.7	101.5	-424.3
60	-485.8	1.9	-425.1
61	-485.9	-98.0	-425.4
62	-486.0	-198.5	-426.7
63	-486.1	-297.6	-426.5
64	-486.2	-398.5	-425.9
65	-486.3	-498.1	-426.7
66	-486.3	-598.2	-427.5
67	-486.3	-698.7	-428.0
68	-474.8	-797.0	-427.8

Post-Test ¹			
Index	Xmm	Ymm	Zmm
52	N/A	N/A	N/A
53	N/A	N/A	N/A
54	N/A	N/A	N/A
55	N/A	N/A	N/A
56	N/A	N/A	N/A
57	N/A	N/A	N/A
58	N/A	N/A	N/A
59	N/A	N/A	N/A
60	N/A	N/A	N/A
61	N/A	N/A	N/A
62	N/A	N/A	N/A
63	N/A	N/A	N/A
64	N/A	N/A	N/A
65	N/A	N/A	N/A
66	N/A	N/A	N/A
67	N/A	N/A	N/A
68	N/A	N/A	N/A

Difference ¹			
Index	Xmm	Ymm	Zmm
52	N/A	N/A	N/A
53	N/A	N/A	N/A
54	N/A	N/A	N/A
55	N/A	N/A	N/A
56	N/A	N/A	N/A
57	N/A	N/A	N/A
58	N/A	N/A	N/A
59	N/A	N/A	N/A
60	N/A	N/A	N/A
61	N/A	N/A	N/A
62	N/A	N/A	N/A
63	N/A	N/A	N/A
64	N/A	N/A	N/A
65	N/A	N/A	N/A
66	N/A	N/A	N/A
67	N/A	N/A	N/A
68	N/A	N/A	N/A

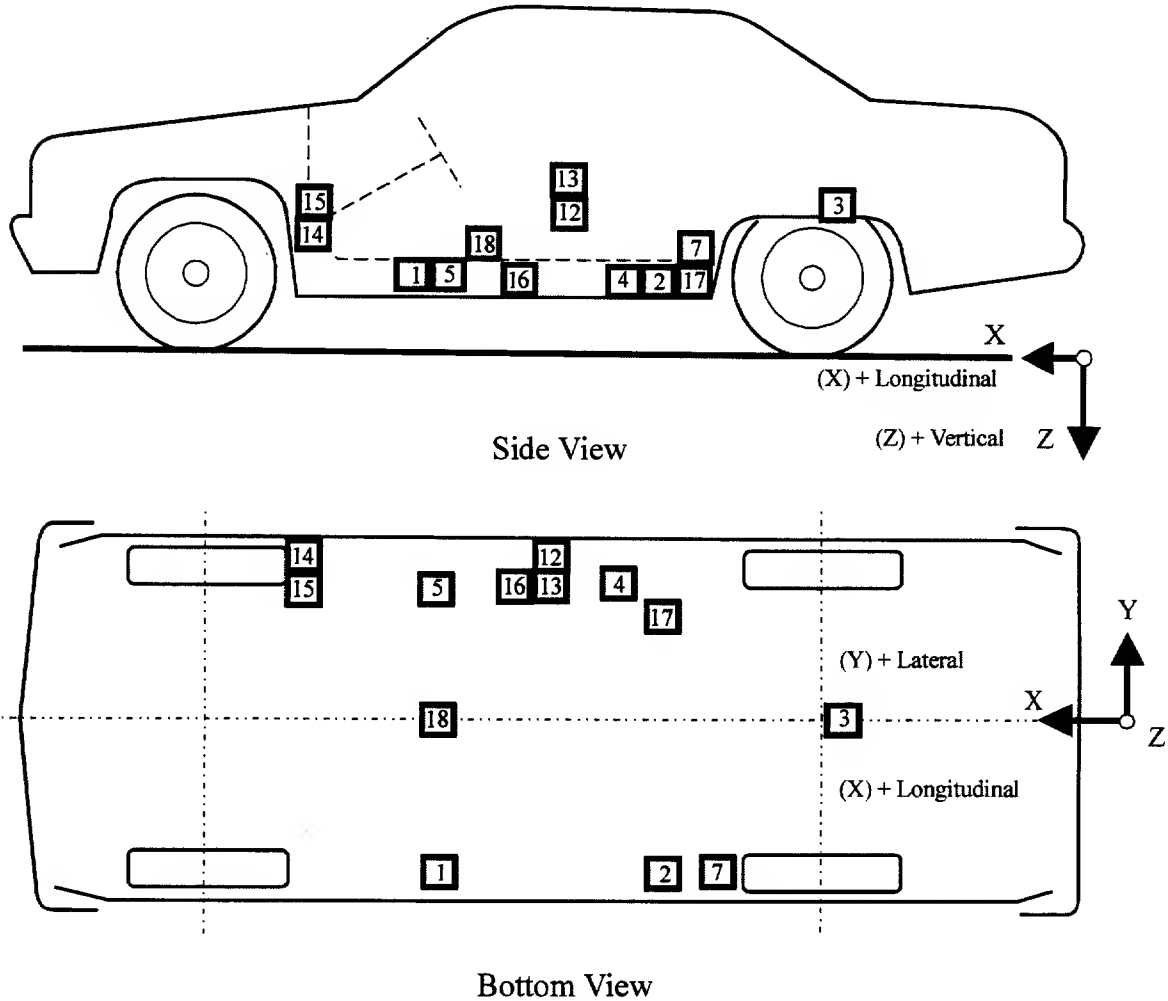
¹ Bumper element separated from the impactor face during impact.

Data Sheet 13

Test Vehicle Accelerometer Locations and Data Summary

Vehicle: 2004 Pontiac Grand Prix GT 4-door sedan

NHTSA No.: C40100



- | | |
|--|--|
| 1-Right Front Side Sill | 10-Left Rear Door Mid Rear (omitted) |
| 2-Right Side Sill at Rear Seat | 11-Left Rear Door Upper Centerline (omitted) |
| 3-Rear Floorpan above Axle | 12-Left Side Lower B-pillar |
| 4-Left Side Sill at Rear Seat | 13-Left Side Middle B-pillar |
| 5-Left Front Side Sill | 14-Left Side Lower A-pillar |
| 6-Left Front Door on Centerline (omitted) | 15-Left Side Middle A-pillar |
| 7-Right Rear Occupant Compartment | 16-Left Side Front Seat Track at H-point |
| 8-Left Front Door Mid Rear (omitted) | 17-Left Rear Seat Track at H-point |
| 9-Left Front Door Upper Centerline (omitted) | 18-Vehicle Center of Gravity |

Data Sheet 13 (Continued)

Test Vehicle Accelerometer Locations and Data SummaryVehicle: 2004 Pontiac Grand Prix GT 4-door sedanNHTSA No.: C40100

TEST NUMBER: 030422-1

No. LOCATION	X	Y	Z	POSITIVE DIRECTION		NEGATIVE DIRECTION	
1 RIGHT SIDE SILL AT FRONT SEAT	3264 mm	710 mm	-262 mm				
LONGITUDINAL				4.0 g	@ 52.5 ms	5.9 g	@ 20.0 ms
LATERAL				20.7 g	@ 9.5 ms	3.1 g	@ 168.3 ms
VERTICAL				2.6 g	@ 108.4 ms	8.9 g	@ 9.6 ms
RESULTANT				22.7 g	@ 9.6 ms		
2 RIGHT SIDE SILL AT REAR SEAT	2174 mm	710 mm	-265 mm				
LONGITUDINAL				4.4 g	@ 52.5 ms	5.4 g	@ 19.3 ms
LATERAL				19.9 g	@ 9.3 ms	2.7 g	@ 175.3 ms
VERTICAL				3.7 g	@ 59.1 ms	4.6 g	@ 15.1 ms
RESULTANT				20.2 g	@ 9.5 ms		
3 REAR FLOORPAN ABOVE AXLE	1104 mm	0 mm	-495 mm				
LONGITUDINAL				3.5 g	@ 49.3 ms	7.9 g	@ 26.2 ms
LATERAL				16.2 g	@ 27.9 ms	2.8 g	@ 110.1 ms
VERTICAL				5.3 g	@ 29.4 ms	4.5 g	@ 10.0 ms
RESULTANT				17.9 g	@ 27.2 ms		
4 LEFT SIDE SILL AT REAR SEAT	2189 mm	-710 mm	-260 mm				
LATERAL				47.3 g	@ 5.0 ms	16.3 g	@ 56.0 ms

Data Sheet 13 (Continued)

Test Vehicle Accelerometer Locations and Data Summary

Vehicle: 2004 Pontiac Grand Prix GT 4-door sedan

NHTSA No.: C40100

TEST NUMBER: 030422-1

No. LOCATION	X	Y	Z	POSITIVE DIRECTION			NEGATIVE DIRECTION		
5 LEFT SIDE SILL AT FRONT SEAT LATERAL	3224 mm	-710 mm	-260 mm	52.4 g	@	3.8 ms	20.2 g	@	9.2 ms
7 RIGHT REAR OCCUPANT COMPARTMENT LATERAL	1999 mm	440 mm	-230 mm	17.9 g	@	9.0 ms	2.7 g	@	172.4 ms
12 LEFT LOWER B-POST LATERAL ¹	2319 mm	-725 mm	-540 mm	162.3 g	@	4.6 ms	33.0 g	@	19.8 ms
13 LEFT MIDDLE B-POST LATERAL ¹	2319 mm	-725 mm	-670 mm	139.7 g	@	4.9 ms	32.3 g	@	19.9 ms
14 LEFT LOWER A-POST LATERAL ¹	3404 mm	-800 mm	-498 mm	---	---		---	---	
15 LEFT MIDDLE A-POST LATERAL ¹	3394 mm	-800 mm	-690 mm	---	---		---	---	
16 LEFT FRONT SEAT TRACK LATERAL	2599 mm	-570 mm	-273 mm	76.3 g	@	4.2 ms	17.2 g	@	23.4 ms
17 LEFT REAR SEAT TRACK LATERAL	1704 mm	-690 mm	-325 mm	23.4 g	@	10.2 ms	2.1 g	@	142.2 ms

Data Sheet 13 (Continued)

Test Vehicle Accelerometer Locations and Data Summary

Vehicle: 2004 Pontiac Grand Prix GT 4-door sedan

NHTSA No.: C40100

TEST NUMBER: 030422-1

No. LOCATION

X

Y

Z

POSITIVE
DIRECTION

NEGATIVE
DIRECTION

18 VEHICLE CENTER	2760 mm	0 mm	-453 mm				
OF GRAVITY							
LONGITUDINAL				9.6 g	@ 86.0 ms	13.8 g	@ 35.3 ms
LATERAL				41.5 g	@ 48.3 ms	31.0 g	@ 80.9 ms
VERTICAL				18.1 g	@ 31.2 ms	23.3 g	@ 73.8 ms
RESULTANT				41.9 g	@ 48.2 ms		

REFERENCE: X: + FORWARD FROM REAR BUMPER
Y: + RIGHTWARD FROM VEHICLE CENTERLINE
Z: + DOWNWARD FROM GROUND LEVEL

For acceleration data sign convention, see Report Sign Convention in Appendix D.

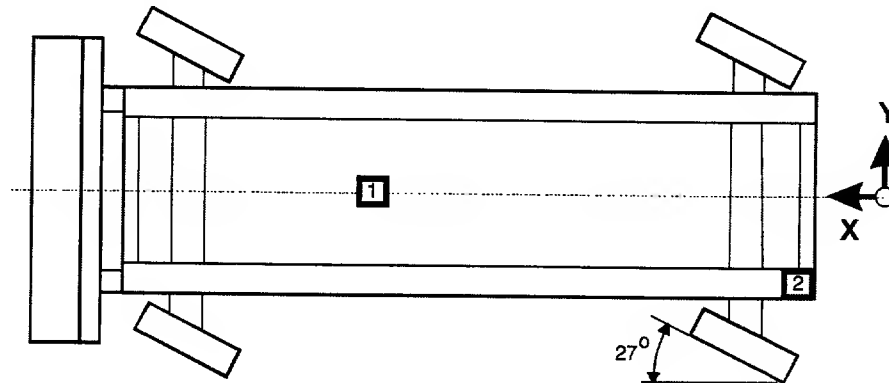
¹ See DATA ACQUISITION EXPLANATIONS

Data Sheet 14

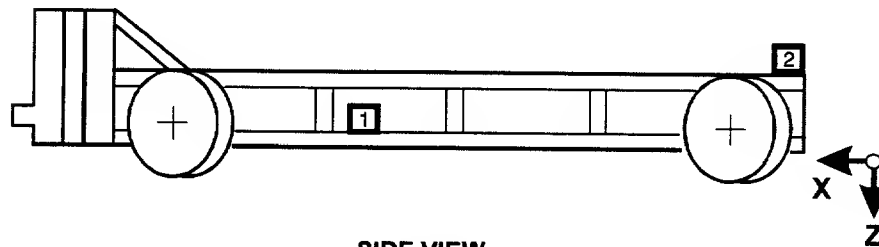
MDB Accelerometer Locations and Data Summary

Vehicle: 2004 Pontiac Grand Prix GT 4-door sedan

NHTSA No.: C40100



TOP VIEW



SIDE VIEW

Accel. No.	Location	Coordinates (millimeters)			Positive Direction		Negative Direction	
		X*	Y*	Z*	Max. (g)	Time (ms)	Max. (g)	Time (ms)
1	MDB Center of Gravity	1855	0	-520				
	Longitudinal ¹ X				3.3	145.4	22.2	39.2
	Lateral ¹ Y				5.0	59.0	12.8	26.8
	Vertical ¹ Z				5.8	14.2	9.0	24.3
	Resultant ¹ R				22.6	39.1	0.1	93.0
2	Rear Frame Member	412	-677	-625				
	Longitudinal X				3.1	120.7	21.0	33.2
	Lateral Y				4.1	27.8	2.6	125.8

*Reference: X = Rear Bumper (+ Forward)

Y = Vehicle Centerline (+ To Right)

Z = Ground Level (+ Down)

All measurements accurate to within ± 3 mm.

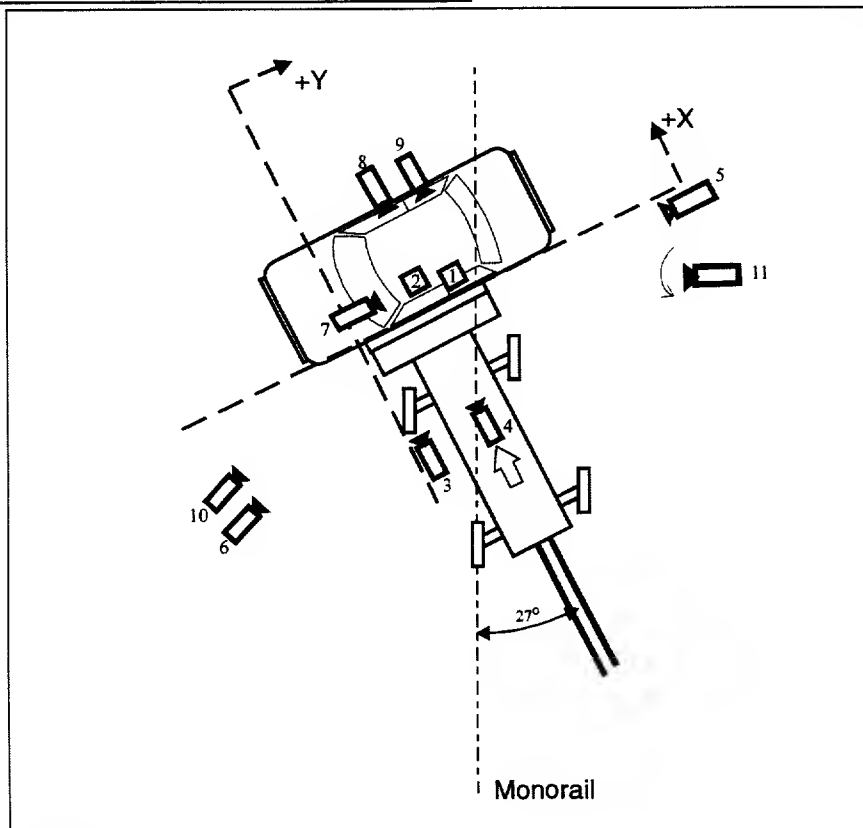
¹ See Data Acquisition Explanations

Data Sheet 15

High-Speed Camera Locations and Data Summary

Vehicle: 2004 Pontiac Grand Prix GT 4-door sedan

NHTSA No.: C40100



Camera Number	Location	Location, mm			Lens		Speed (fps)
		X	Y	Z	(deg)	(mm)	
1	Overhead wide	250	2150	-5750	-76.0	8.5	N/A ¹
2	Overhead tight	370	1800	-5750	-88.5	17	1010
3	Onboard MDB left side	-1750	-40	-720	-0.1	13	1025
4	Onboard MDB center	-2480	830	-1353	-3.5	25	N/A ¹
5	Right side of MDB	-1000	11,700	-1130	0.0	13	1000
6	Left side of MDB	-2400	-5450	-940	-2.4	13	N/A ²
7	Onboard vehicle front	600	-440	-1180	-6.2	8	290
8	Onboard side front door	1770	700	-1050	-0.8	8	985
9	Onboard side rear door	1670	1620	-1100	-3.6	8	1025
10	Digital overall event	-2100	-6000	-1150	-3.2	13	1000
11	Real-time Panning-Video	N/A	N/A	N/A	N/A	Zoom	30

+X: Forward (referenced to MDB) from impact point

+Y: Rightward (referenced to MDB) from impact point

+Z: Downward from ground level

¹ Film speed could not be determined; no LEDs.

² Too slow to time.

Section 5

Vehicle Fuel System Integrity

Data Sheet 16

FMVSS 301 Fuel System Integrity Data

NHTSA No.: C40100

Test Date: 04/22/03

Vehicle Year/Make/Model/Body Style: 2004 Pontiac Grand Prix GT 4-door sedan

Test Vehicle Impact Type :

- ☐ Frontal (48.28 km/h)
☐ Oblique (48.28 km/h) with ____° barrier
face first contacting the (driver/passenger) side
☐ Rear Moving Barrier (48.28 km/h)
☐ Lateral Moving Barrier (32.19 km/h)
☒ Side Impact Moving Deformable Barrier
(62.2 km/h) contacting the ____ driver's side

Fuel Spillage Measurement:

1. From impact until vehicle motion ceases
2. For five-minute period after vehicle motion ceases
3. For next 25 minutes.

Actual	Maximum Allowed
0 g	28 g
0 g	142 g
0 g	28 g/1 minute

Solvent Spillage Details :

None

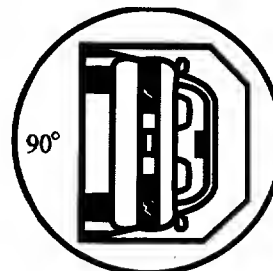
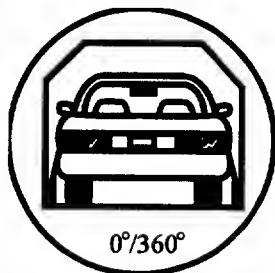
Data Sheet 17

FMVSS 301 Rollover Data

Vehicle: 2004 Pontiac Grand Prix GT 4-door sedan

NHTSA No.: C40100

0 - 90 Degrees



1. Determination of Solvent Collection Time Period:

Rollover Fixture 90° Rotation Time 1 minutes 30 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds

Total 6 minutes 30 seconds

Next whole minute interval 7 minutes

2. FMVSS 301 Requirements:

(1) Time Period

First 5 minutes from onset of rotation	6th min.	7th min.	8th min. (if required)
--	----------	----------	------------------------

(2) Maximum Allowable Solvent Spillage

142 g	28 g	28 g	28 g
-------	------	------	------

3. Actual Test Vehicle Solvent Spillage:

0 g	0 g	0 g	N/A
-----	-----	-----	-----

Note: Record spillage for whole minute intervals only as determined above.

4. Solvent Spillage Location(s):

None

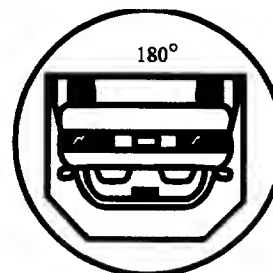
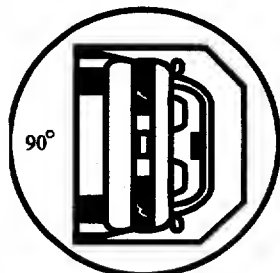
Data Sheet 17 (Continued)

FMVSS 301 Rollover Data

Vehicle: 2004 Pontiac Grand Prix GT 4-door sedan

NHTSA No.: C40100

90 - 180 Degrees



1. Determination of Solvent Collection Time Period:

Rollover Fixture 90° Rotation Time 1 minutes 30 seconds
(Spec. Range = 1 to 3 minutes)
FMVSS 301 Position Hold Time + 5 minutes 0 seconds
Total 6 minutes 30 seconds
Next whole minute interval 7 minutes

2. FMVSS 301 Requirements:

(1) Time Period

First 5 minutes from onset of rotation	6th min.	7th min.	8th min. (if required)
--	----------	----------	------------------------

(2) Maximum Allowable Solvent Spillage

142 g	28 g	28 g	28 g
-------	------	------	------

3. Actual Test Vehicle Solvent Spillage:

0 g	0 g	0 g	N/A
-----	-----	-----	-----

Note: Record spillage for whole minute intervals only as determined above.

4. Solvent Spillage Location(s):

None

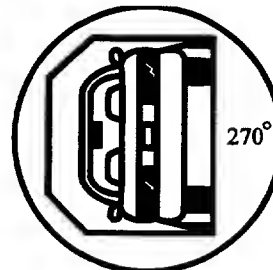
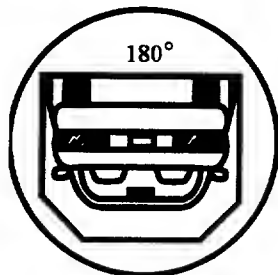
Data Sheet 17 (Continued)

FMVSS 301 Rollover Data

Vehicle: 2004 Pontiac Grand Prix GT 4-door sedan

NHTSA No.: C40100

180 - 270 Degrees



1. Determination of Solvent Collection Time Period:

Rollover Fixture 90° Rotation Time 1 minutes 30 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds

Total 6 minutes 30 seconds

Next whole minute interval 7 minutes

2. FMVSS 301 Requirements:

(1) Time Period

First 5 minutes from onset of rotation	6th min.	7th min.	8th min. (if required)
--	----------	----------	------------------------

(2) Maximum Allowable Solvent Spillage

142 g	28 g	28 g	28 g
-------	------	------	------

3. Actual Test Vehicle Solvent Spillage:

0 g	0 g	0 g	N/A
-----	-----	-----	-----

Note: Record spillage for whole minute intervals only as determined above.

4. Solvent Spillage Location(s):

None

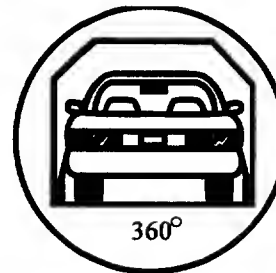
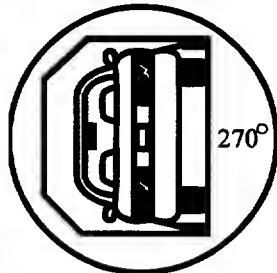
Data Sheet 17 (Continued)

FMVSS 301 Rollover Data

Vehicle: 2004 Pontiac Grand Prix GT 4-door sedan

NHTSA No.: C40100

270 - 360 Degrees



1. Determination Of Solvent Collection Time Period:

Rollover Fixture 90° Rotation Time 1 minutes 30 seconds
(Spec. Range = 1 to 3 minutes)
FMVSS 301 Position Hold Time + 5 minutes 0 seconds
Total 6 minutes 30 seconds
Next whole minute interval 7 minutes

2. FMVSS 301 Requirements:

(1) Time Period

First 5 minutes from onset of rotation	6th min.	7th min.	8th min. (if required)
--	----------	----------	------------------------

(2) Maximum Allowable Solvent Spillage

142 g	28 g	28 g	28 g
-------	------	------	------

3. Actual Test Vehicle Solvent Spillage:

0 g	0 g	0 g	N/A
-----	-----	-----	-----

Note: Record spillage for whole minute intervals only as determined above.

4. Solvent Spillage Location(s):

None

Appendix A

Photographs

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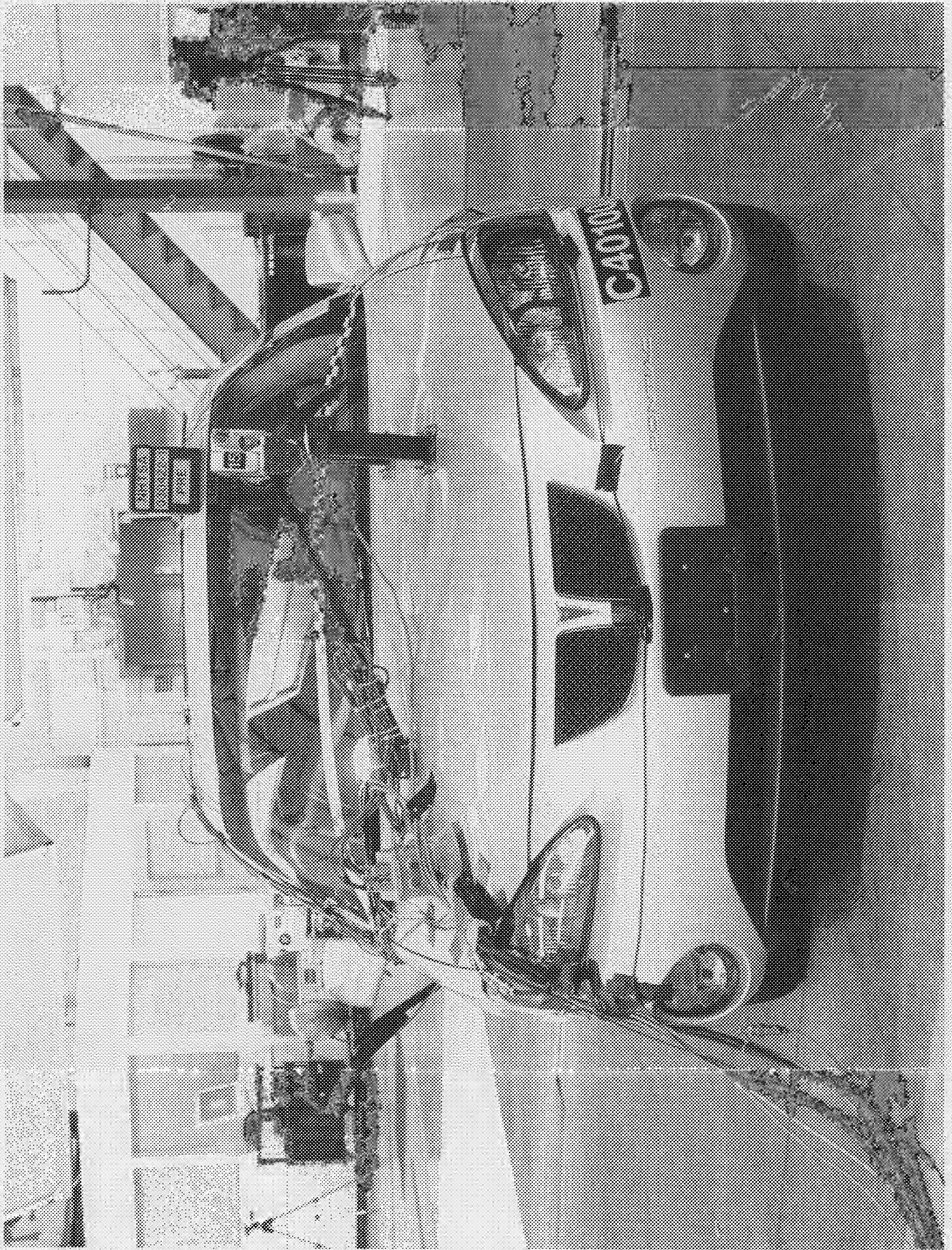


Figure A-1 Pre-Test Front View of Test Vehicle



Figure A-2 Post-Test Front View of Test Vehicle

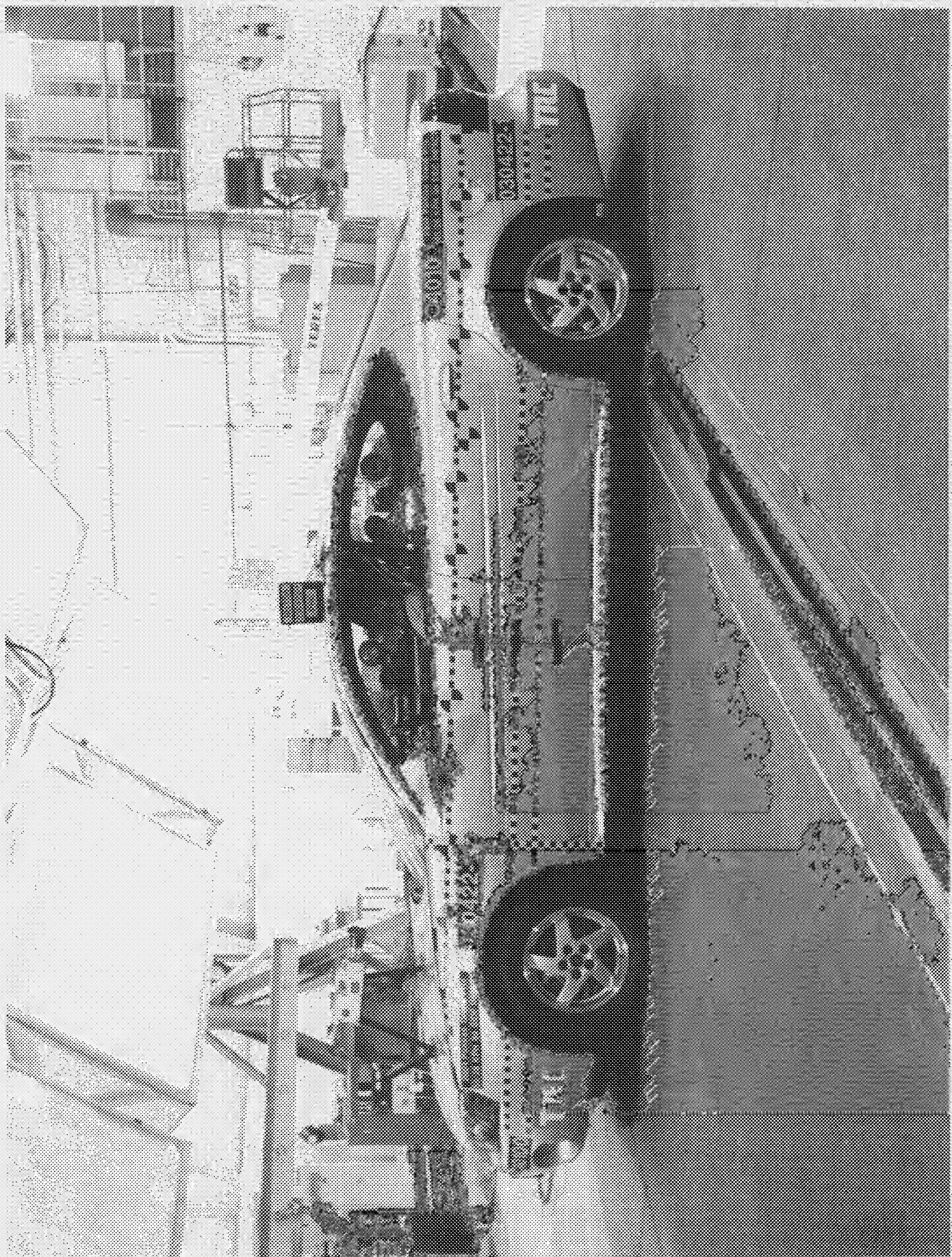


Figure A-3 Pre-Test Impacted Side View of Test Vehicle

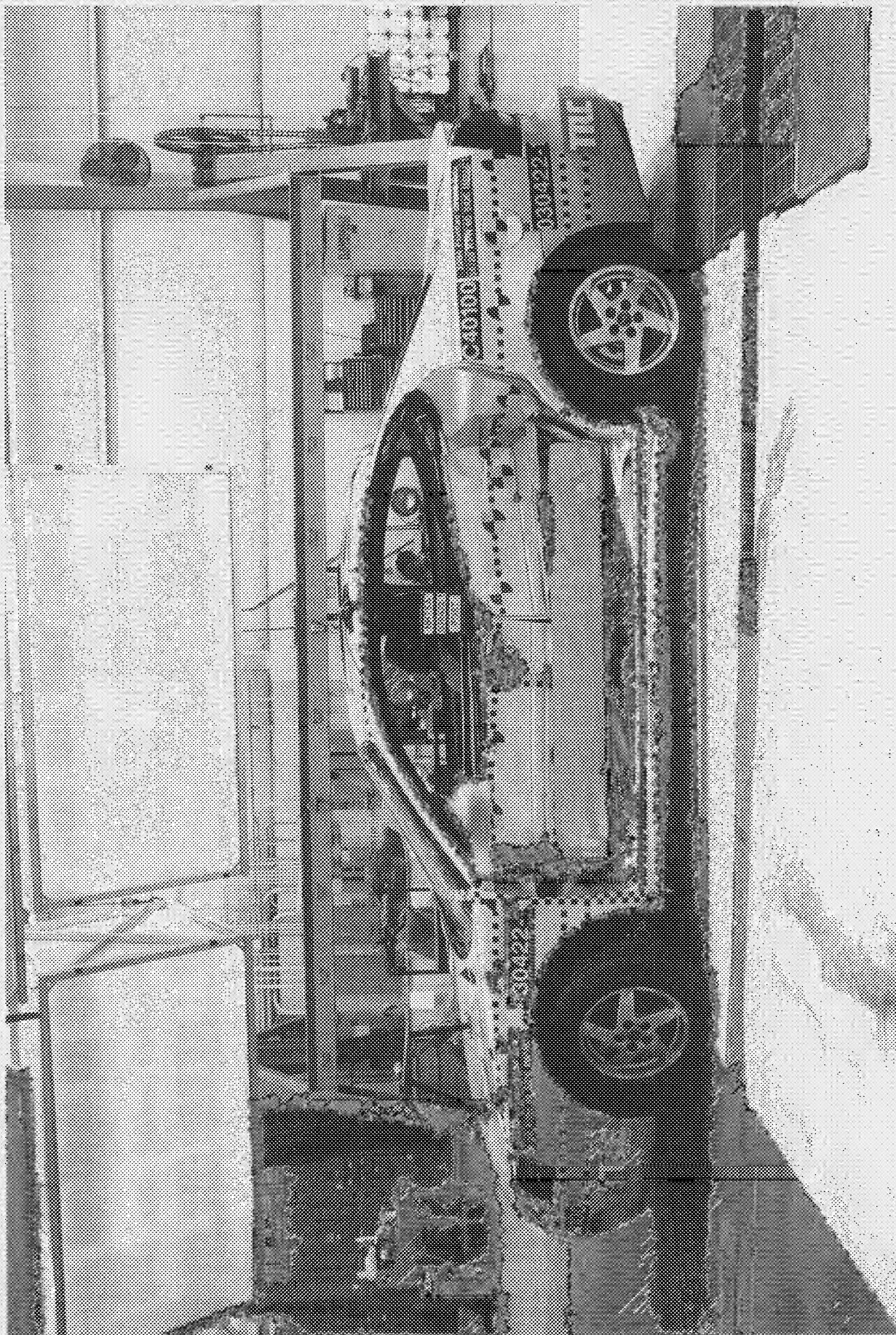


Figure A-4 Post-Test Impacted Side View of Test Vehicle



Figure A-5 Pre-Test Rear View of Test Vehicle

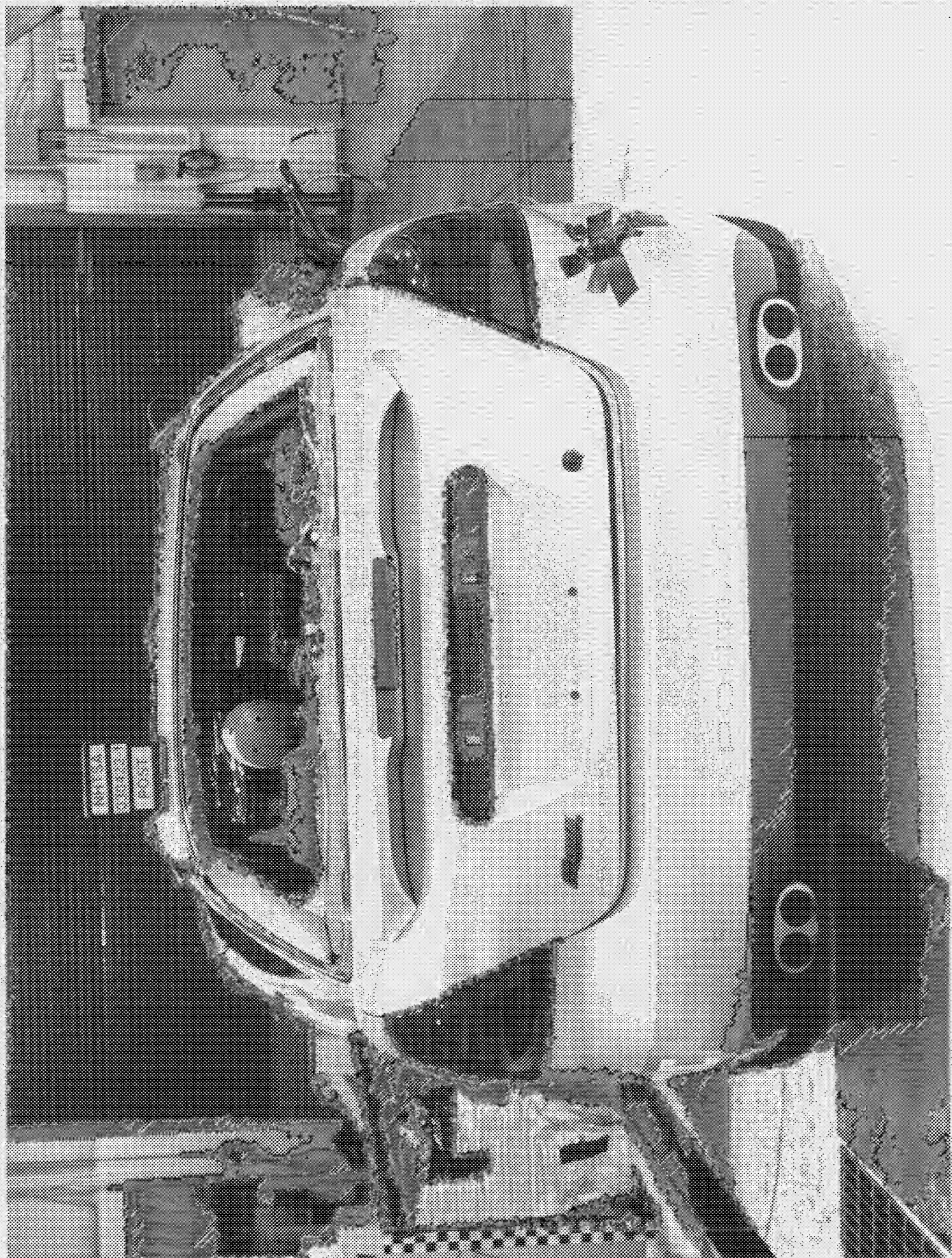


Figure A-6 Post-Test Rear View of Test Vehicle

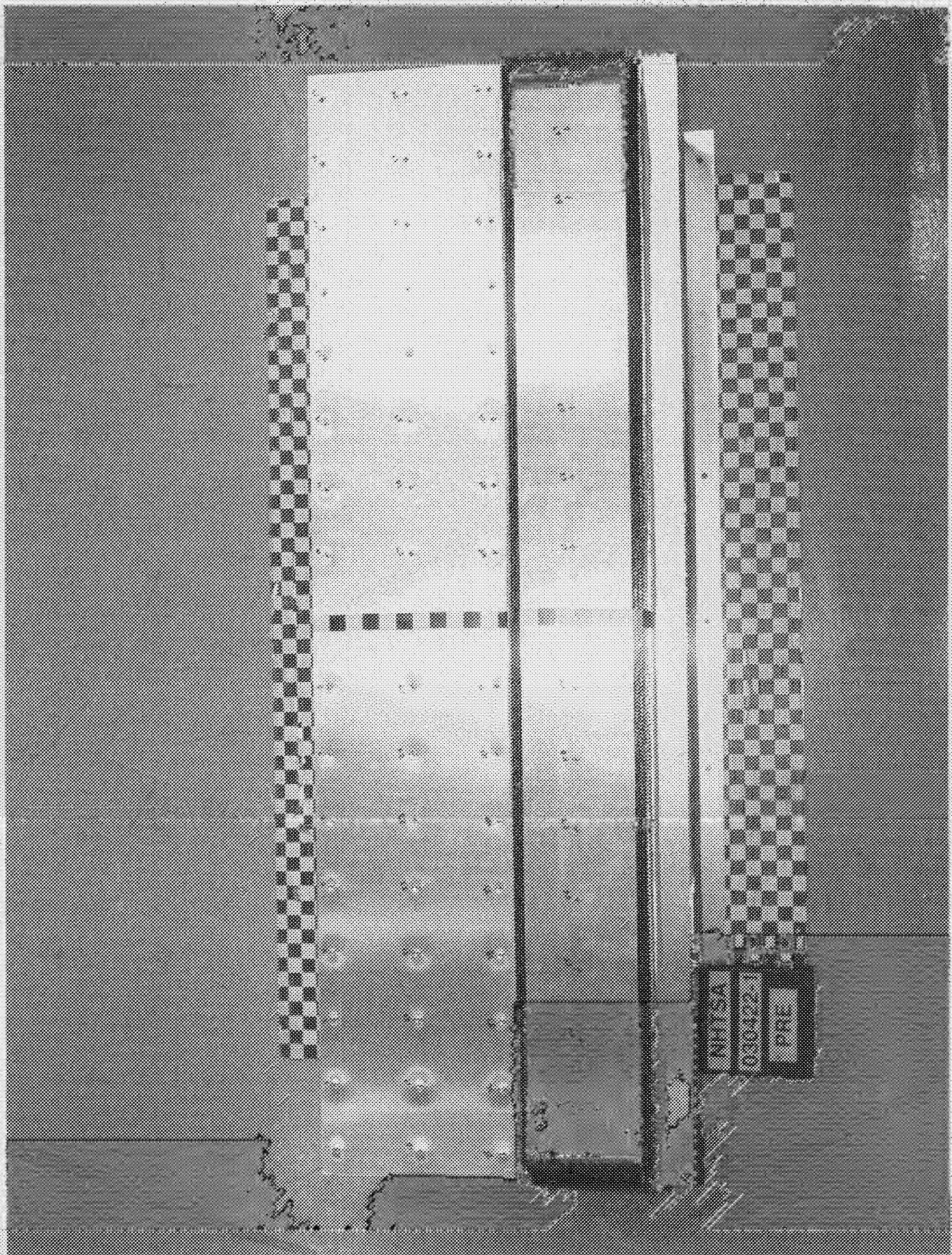


Figure A-7 Pre-Test Frontal View of Impactor Face

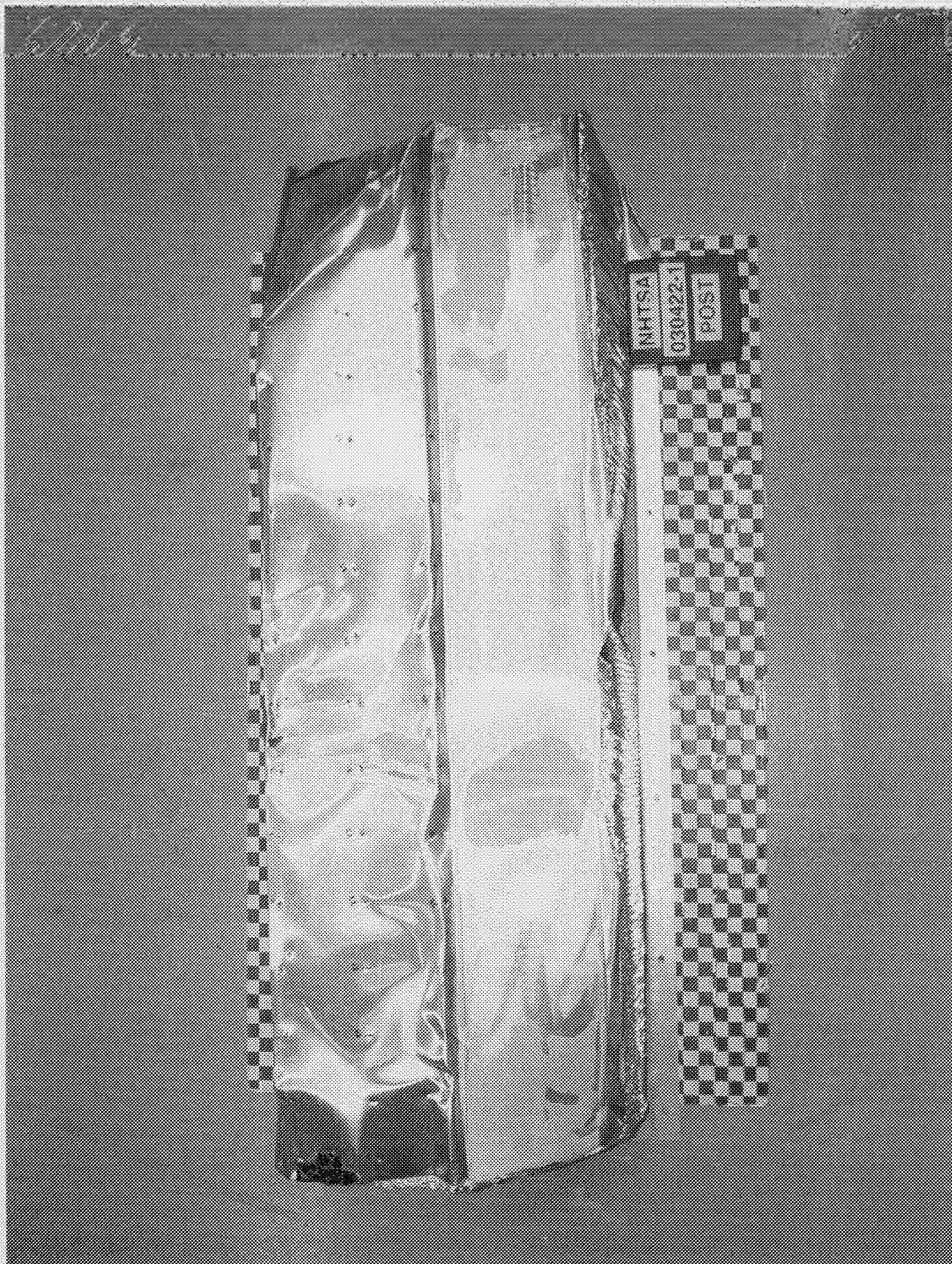


Figure A-8 Post-Test Frontal View of Impactor Face

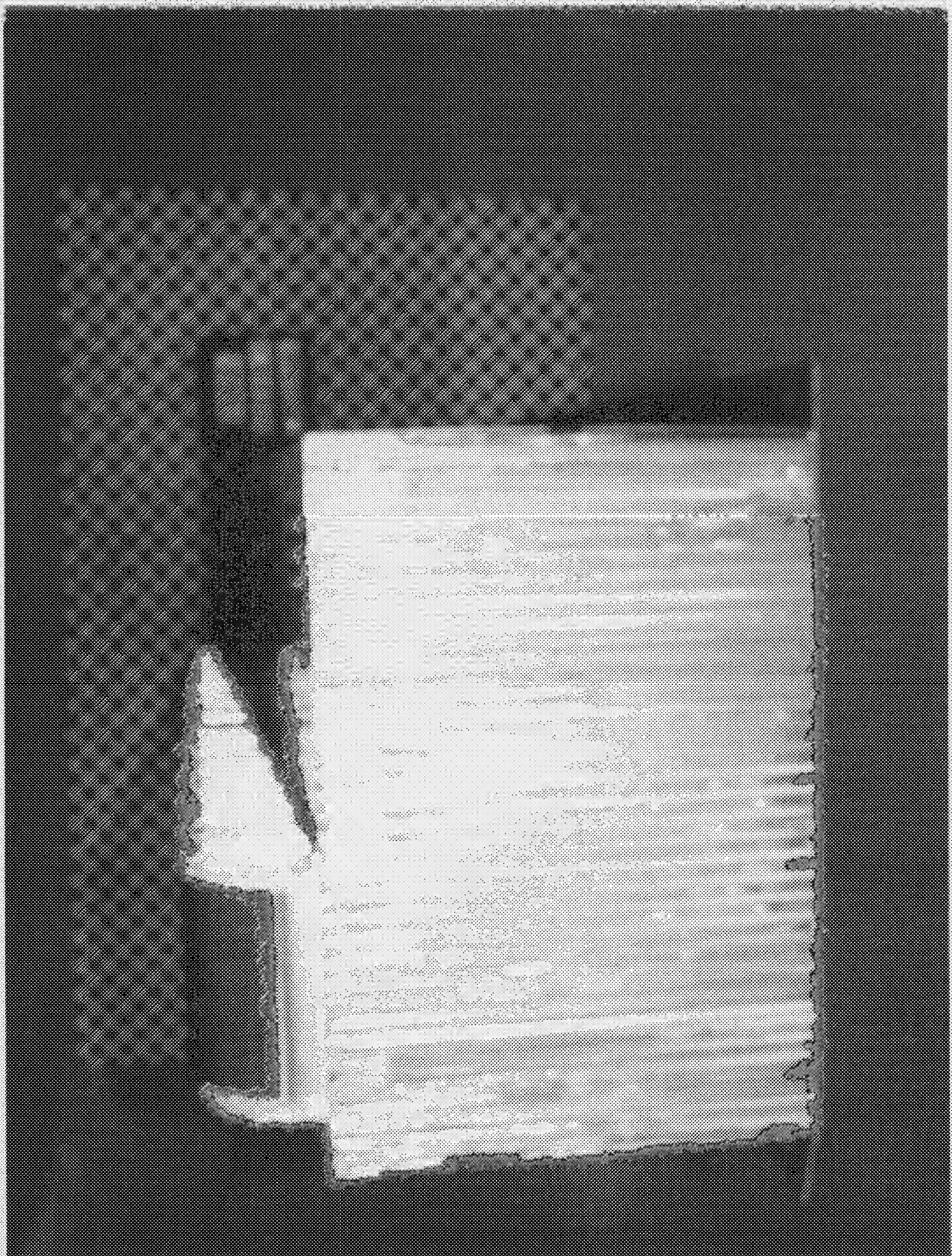


Figure A-9 Pre-Test Left Side View of Impactor Face

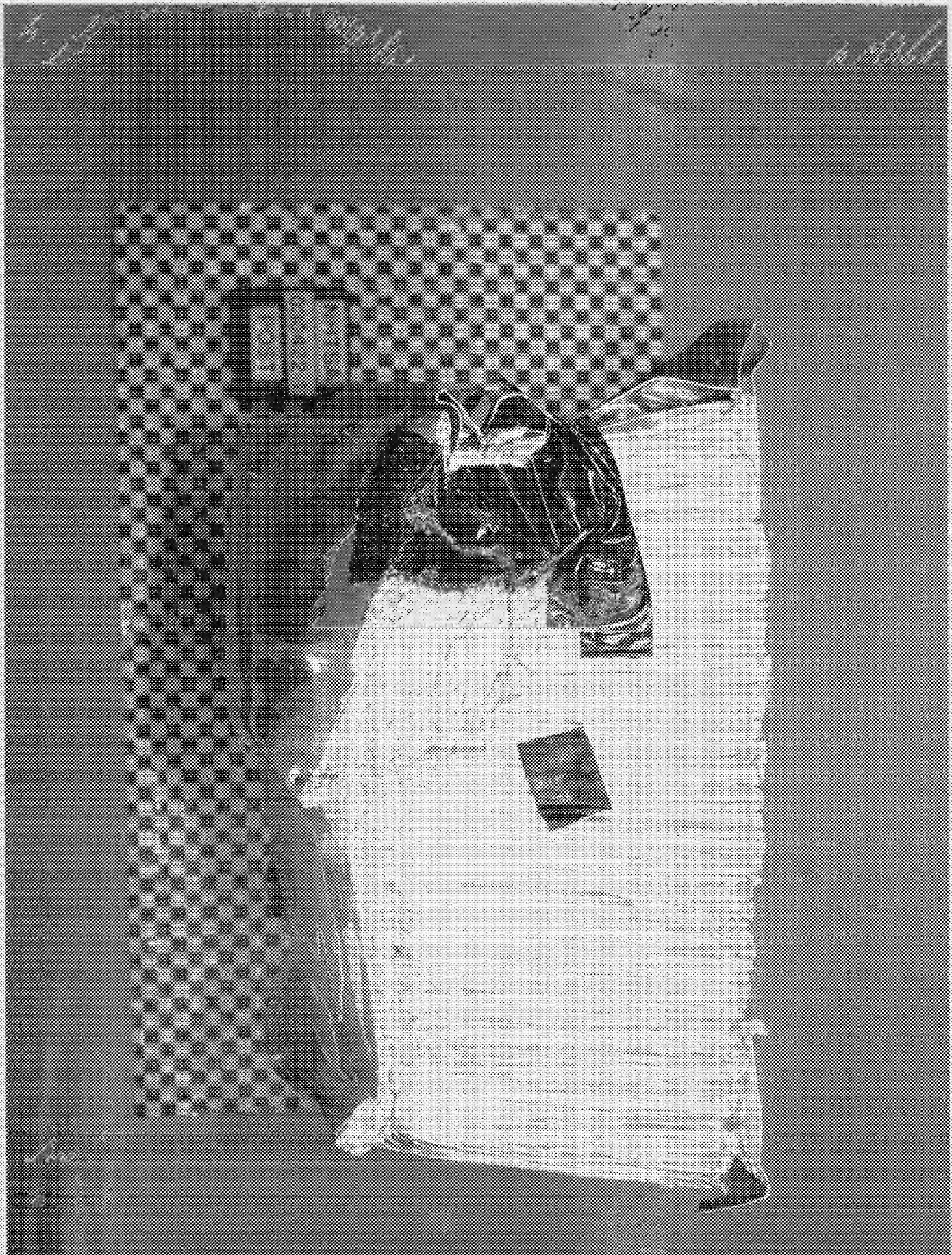


Figure A-10 Post-Test Left Side View of Impactor Face

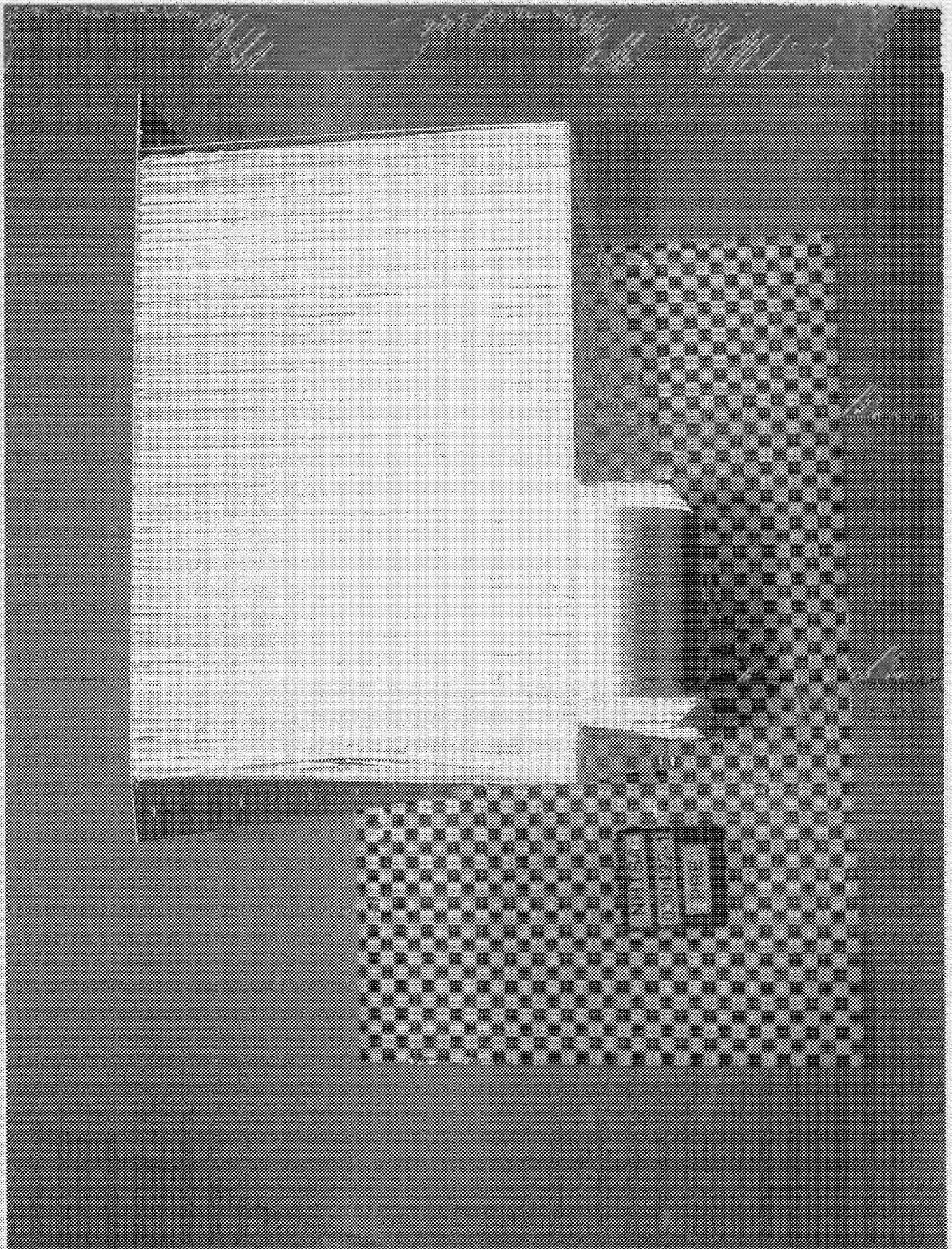


Figure A-11 Pre-Test Right Side View of Impactor Face



Figure A-12 Post-Test Right Side View of Impactor Face

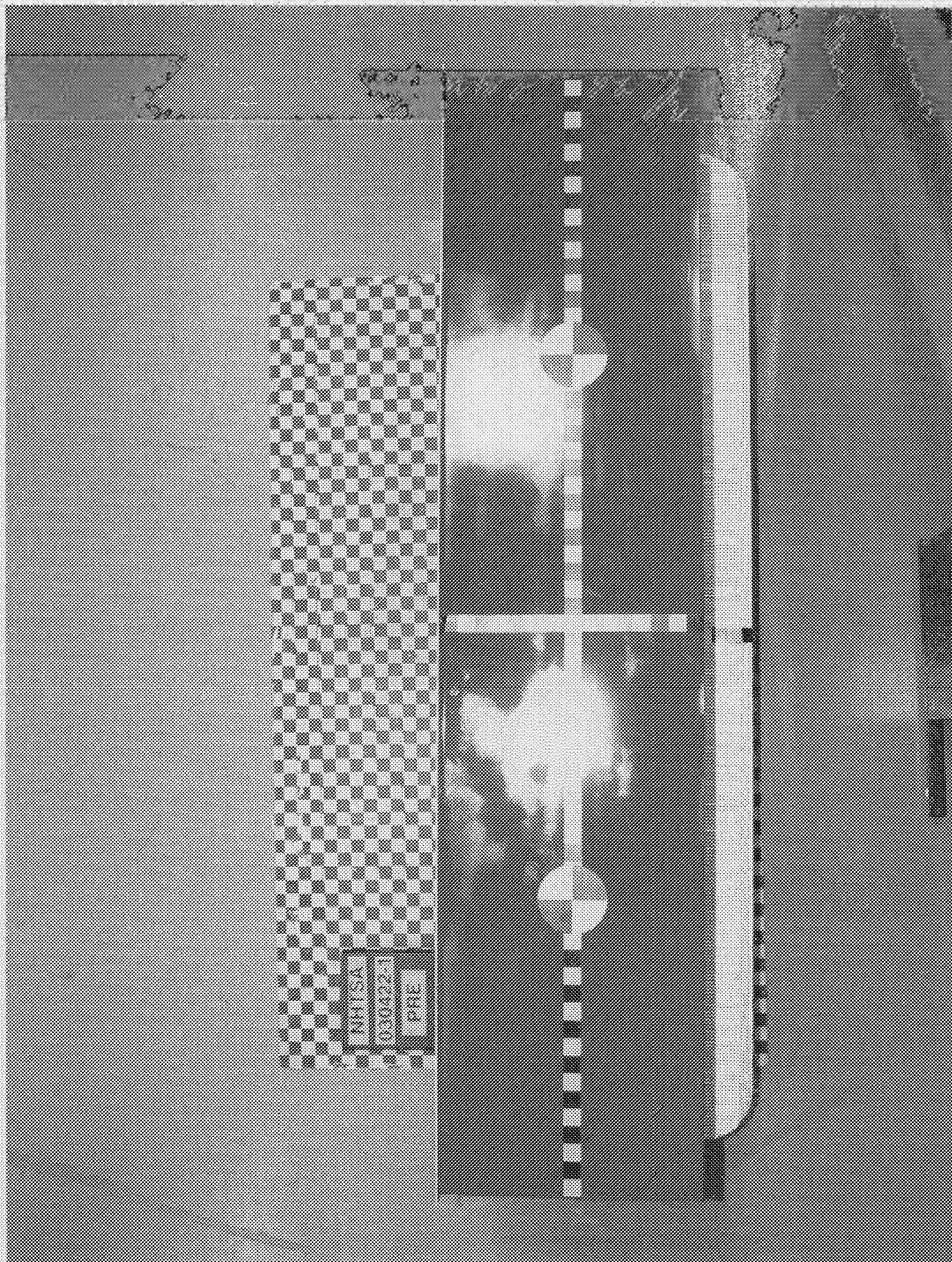


Figure A-13 Pre-Test Top View of Impactor Face

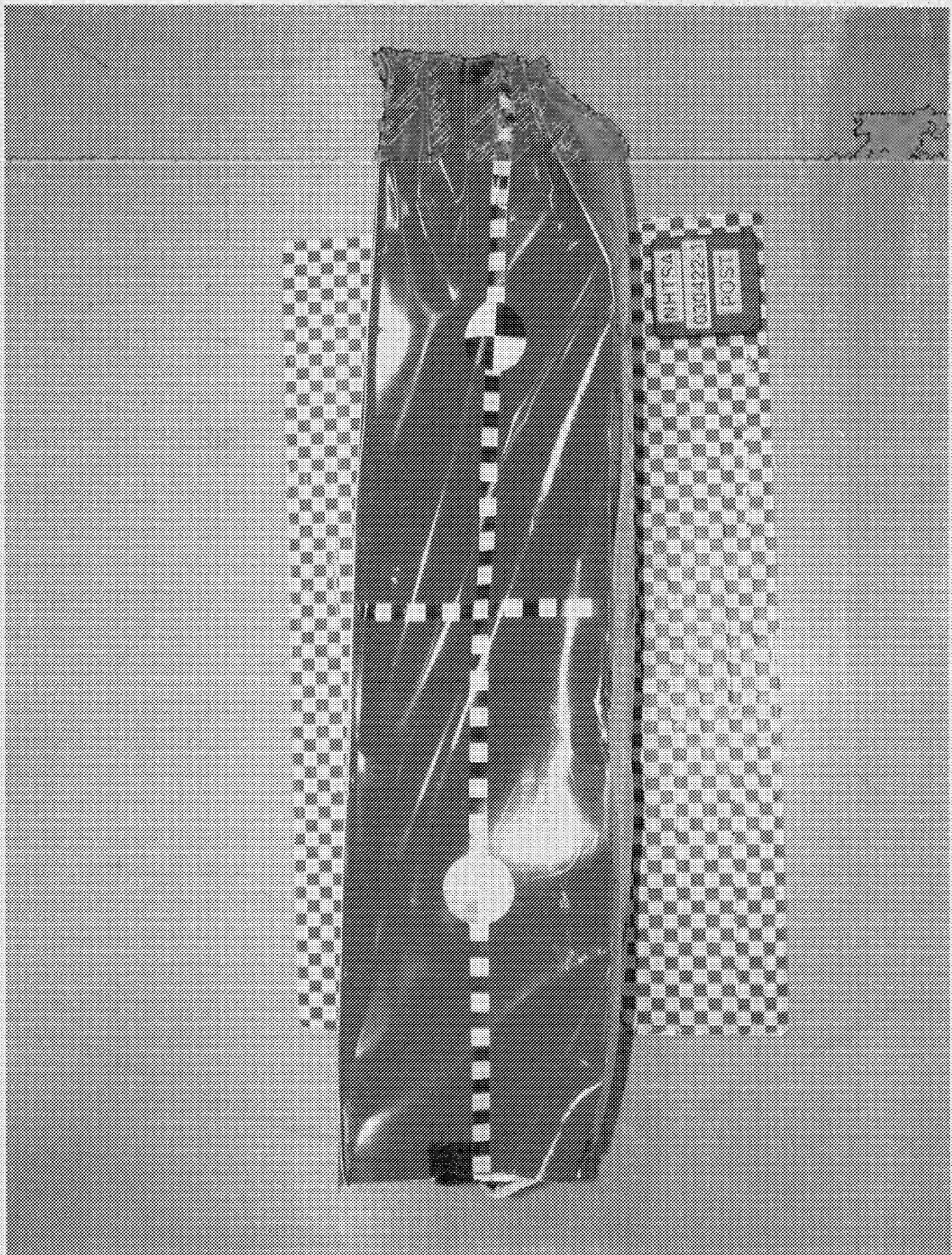


Figure A-14 Post-Test Top View of Impactor Face

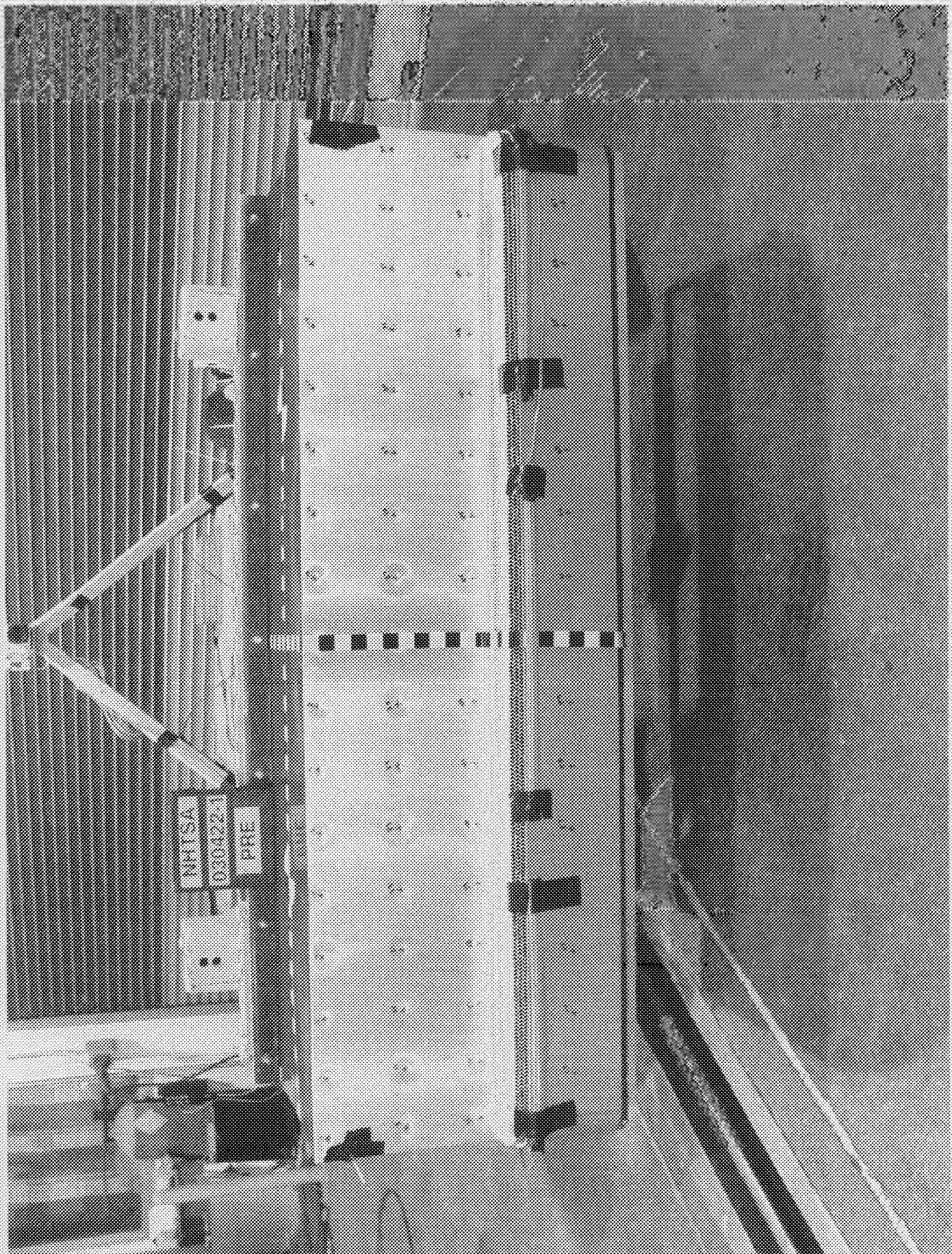


Figure A-15 Pre-Test View of MDB Showing Contact Switches in Place



Figure A-16 Pre-Test Overhead View of MDB Aligned with Vehicle

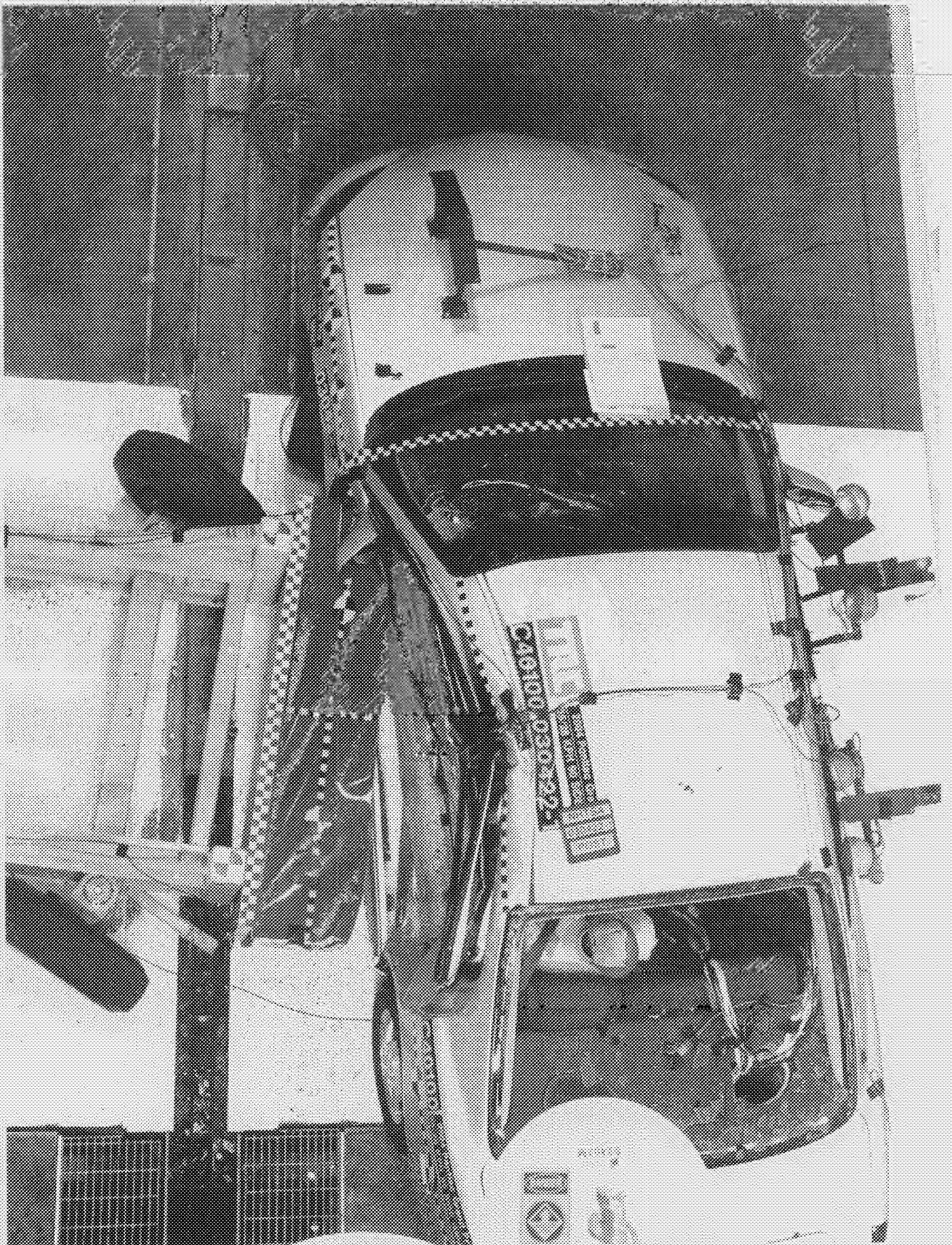


Figure A-17 Post-Test Overhead View of MDB and Vehicle

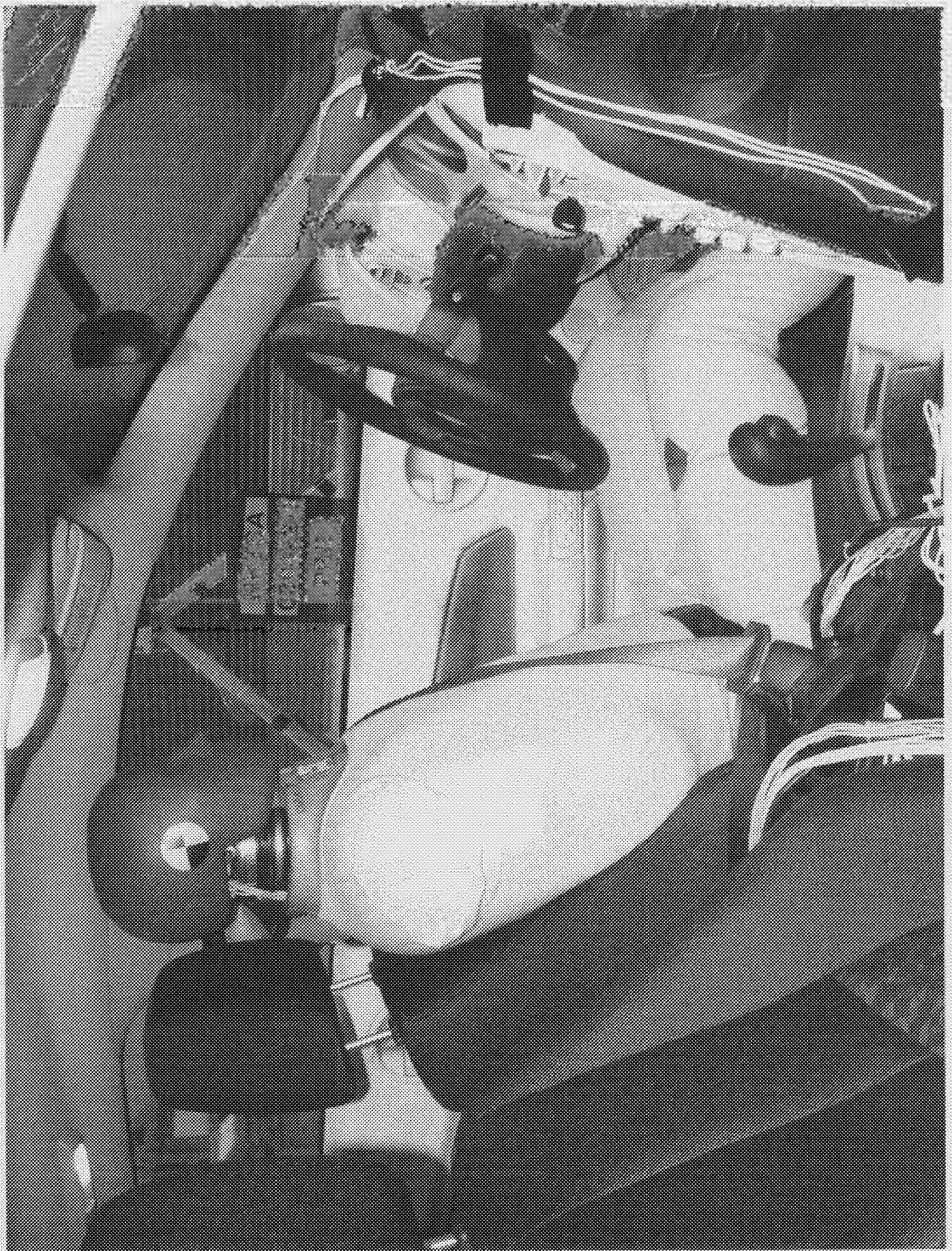


Figure A-18 Pre-Test Right Occupant Compartment View of Front SID-H3



Figure A-19 Post-Test Right Occupant Compartment View of Front SID-H3

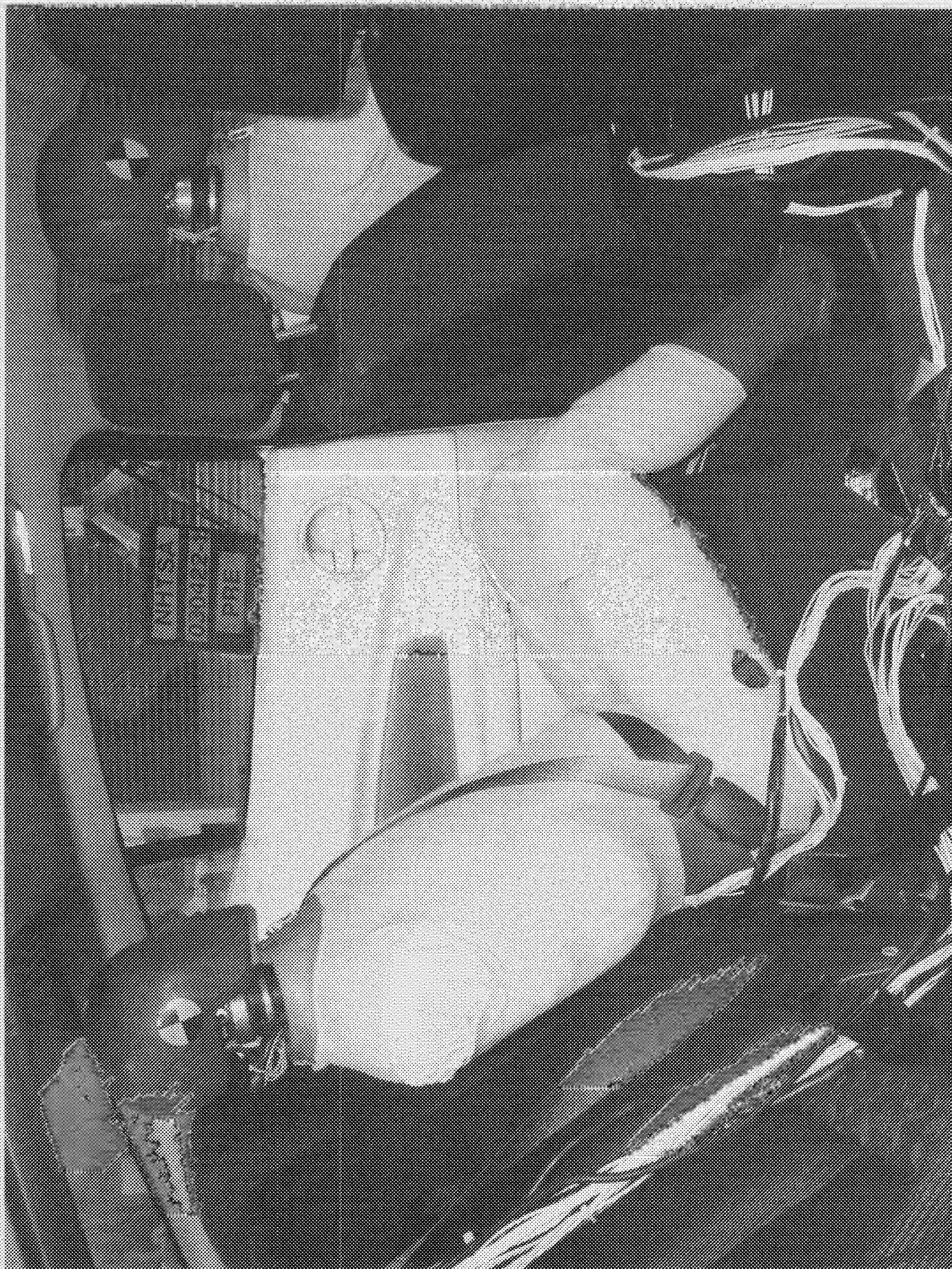


Figure A-20 Pre-Test Right Occupant Compartment View of Rear SID-H3

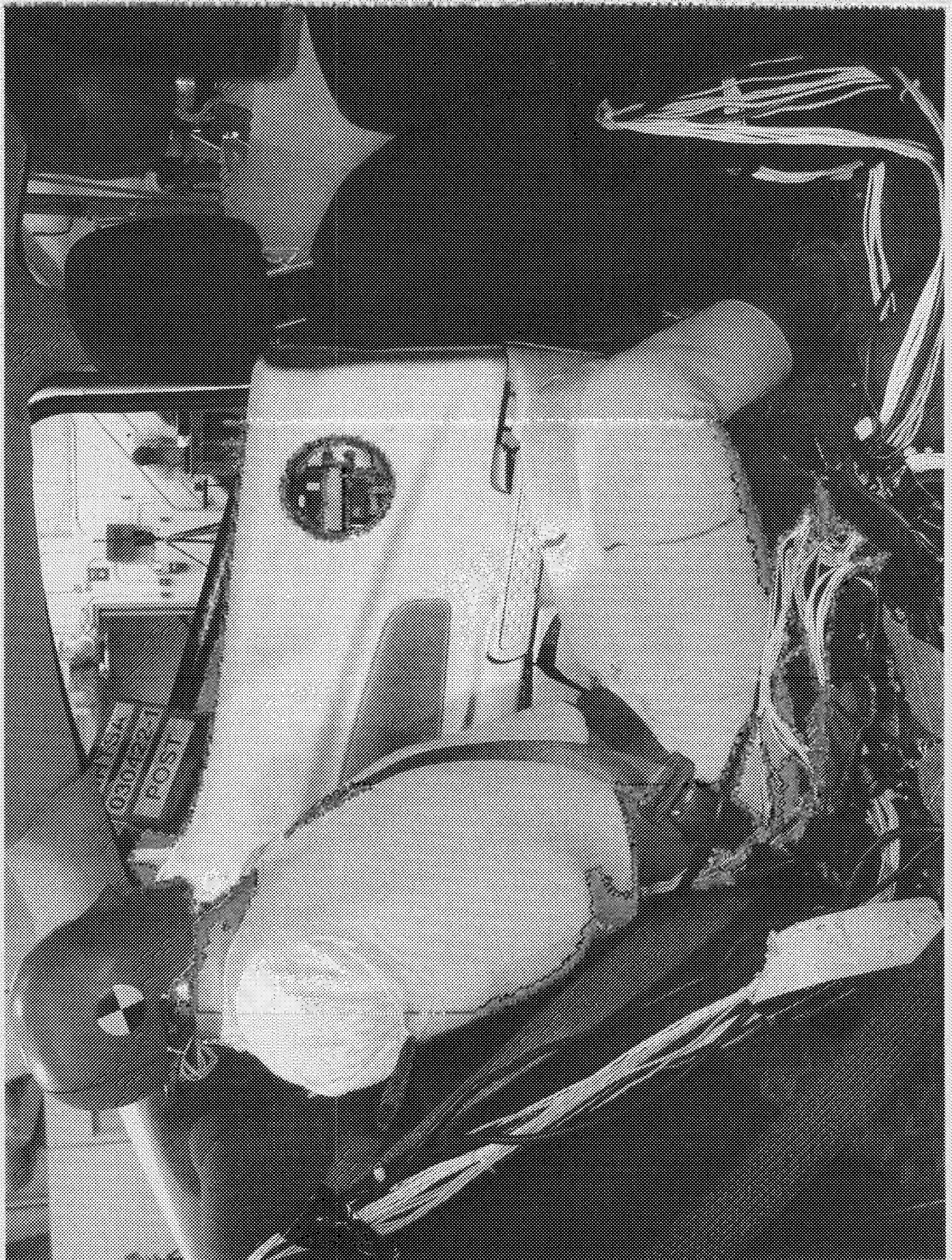


Figure A-21 Post-Test Right Occupant Compartment View of Rear SID-H3

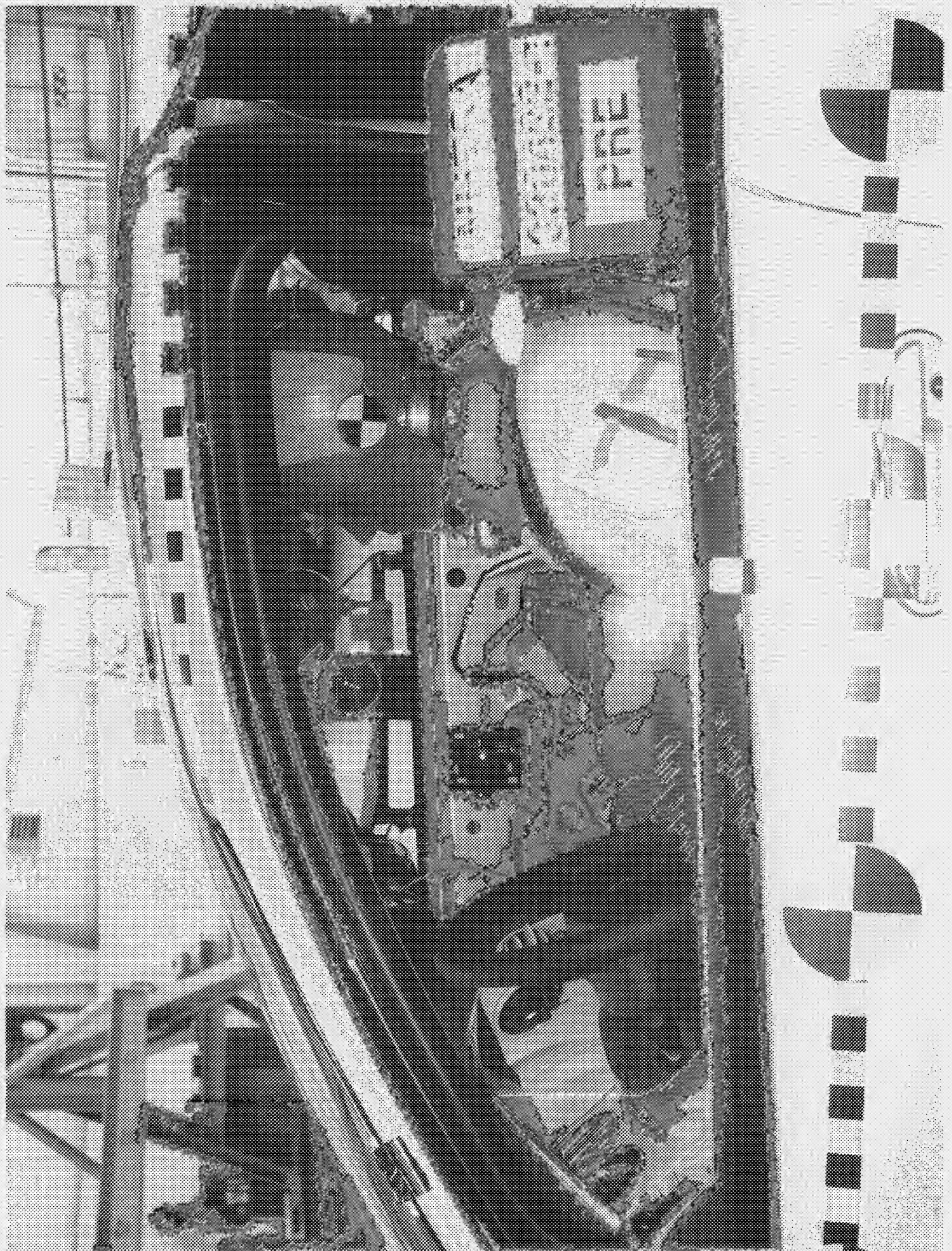


Figure A-22 Pre-Test Left View of Front SID-H3

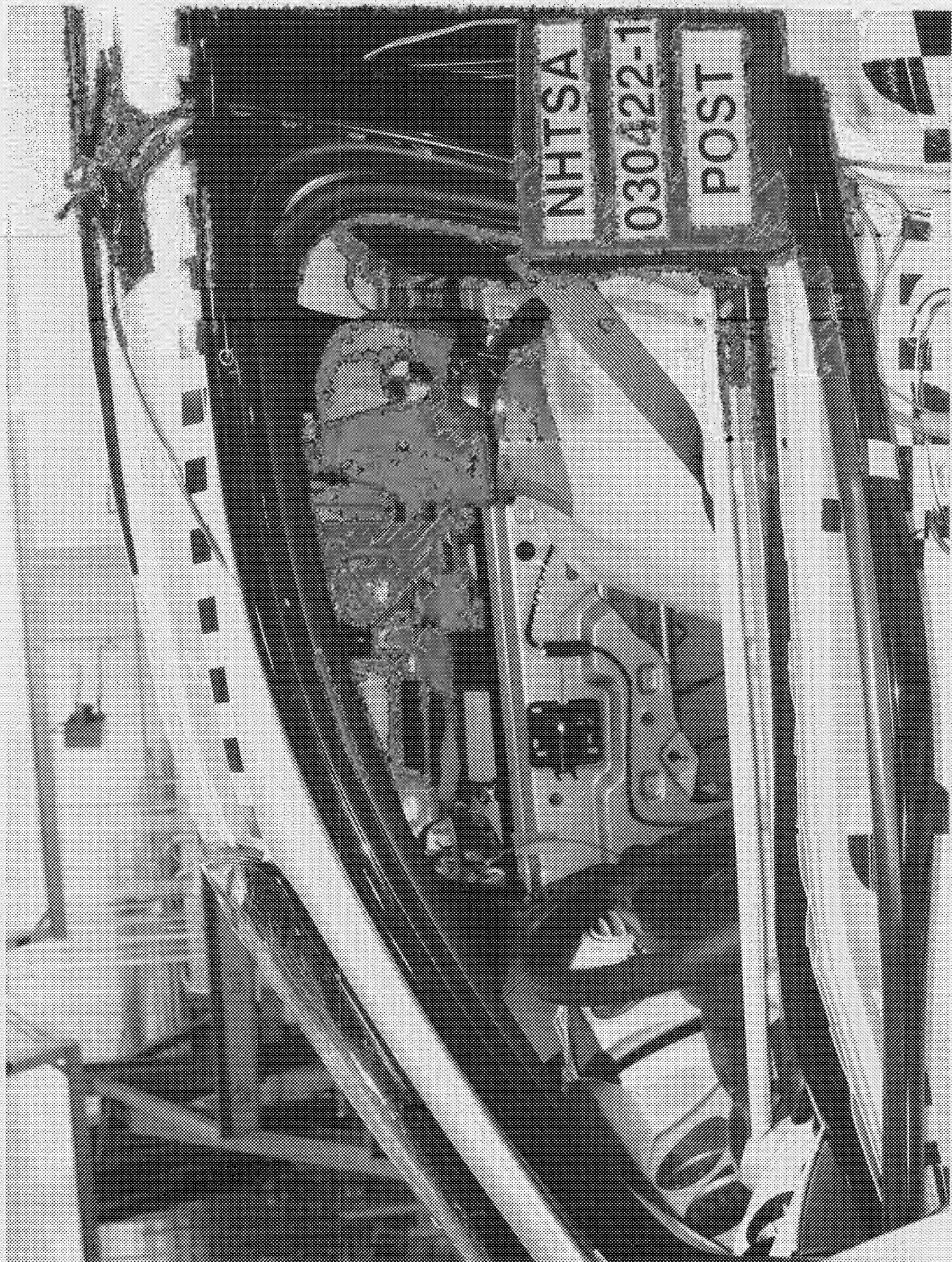


Figure A-23 Post-Test Left View of Front SID-H3

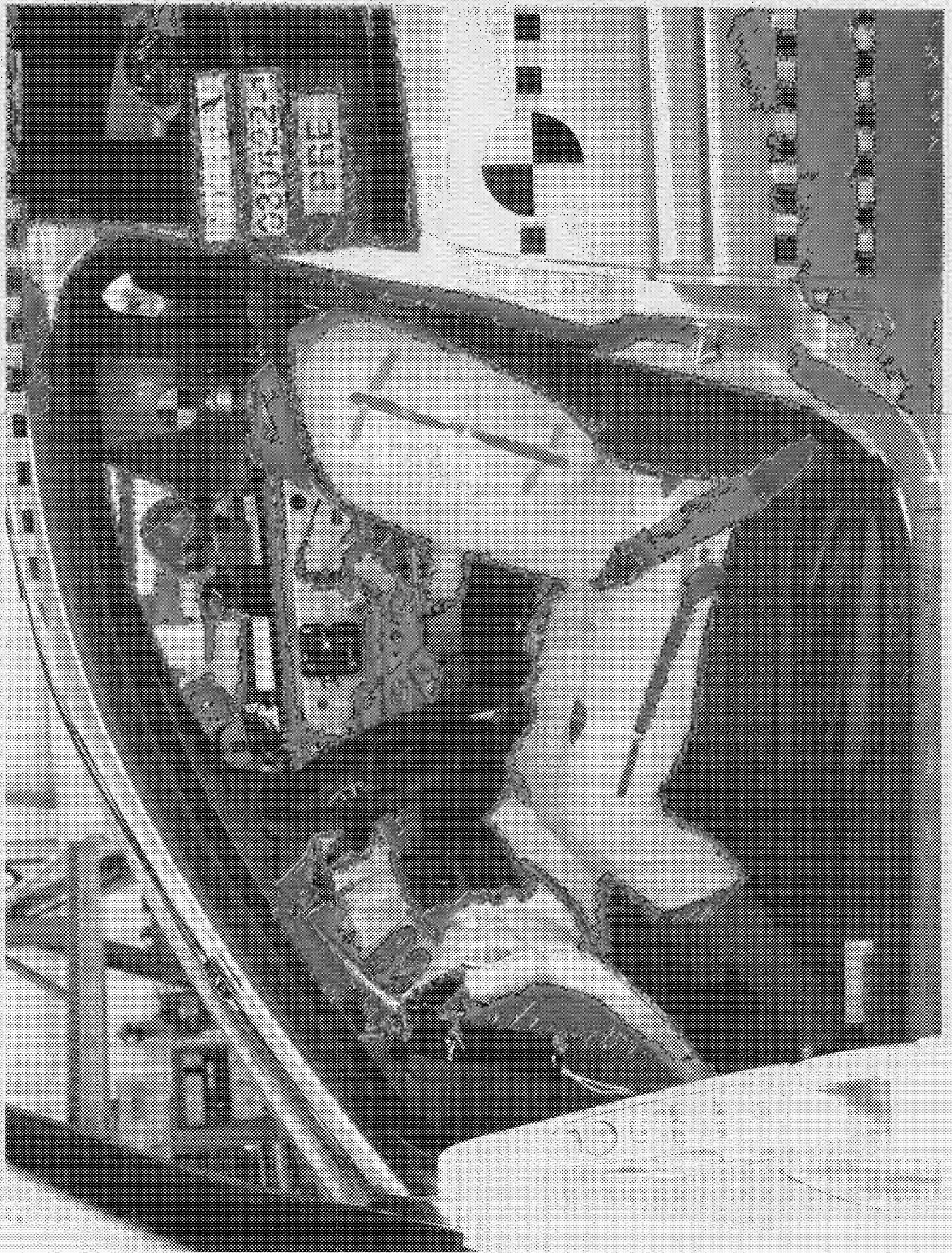


Figure A-24 Pre-Test Left View of Front SID-H3 and Belt Position

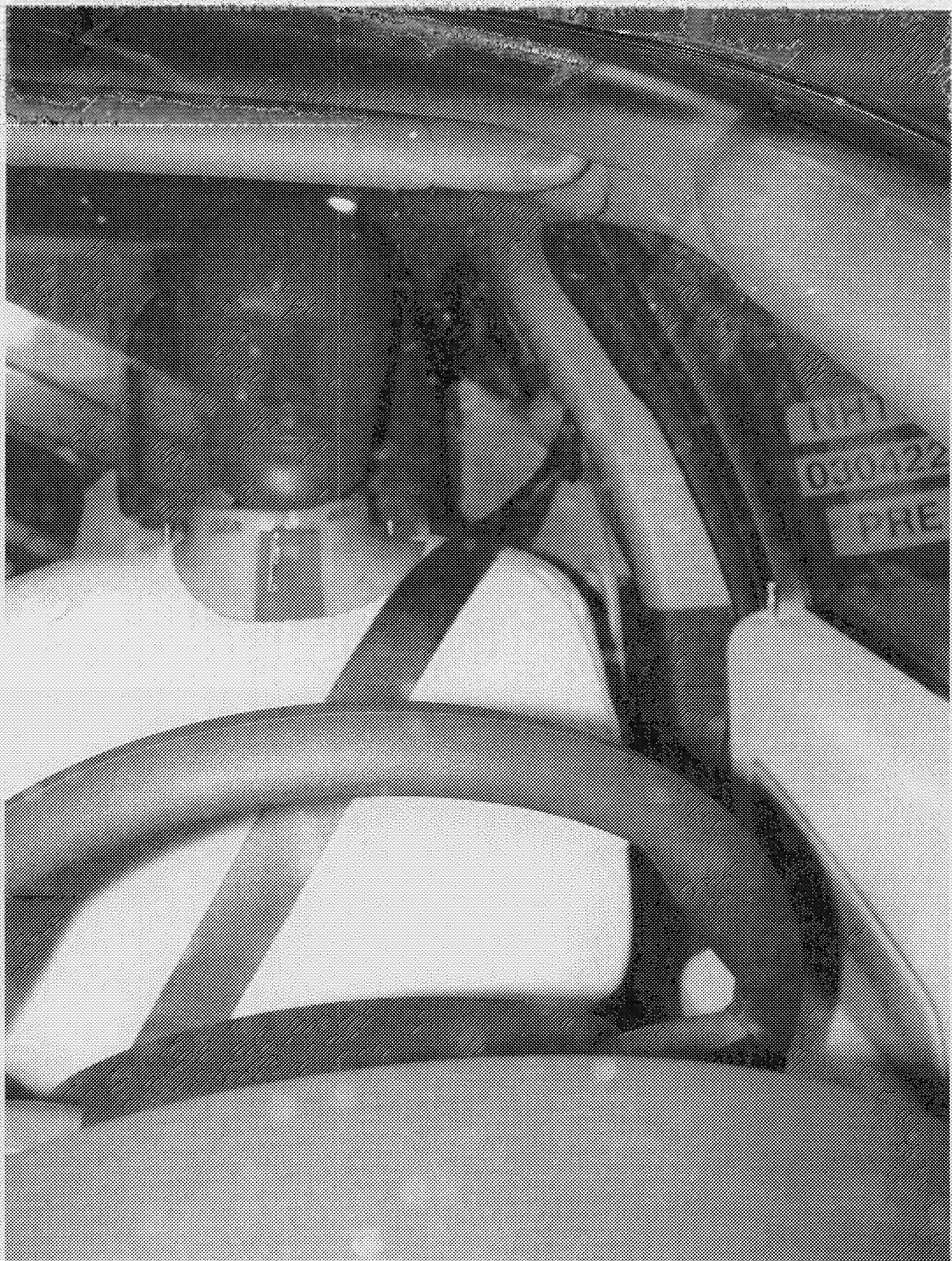


Figure A-25 Pre-Test Left View of Front SID-H3 and Door Clearance



Figure A-26 Post-Test Left View of Front SID-H3 and Door Clearance

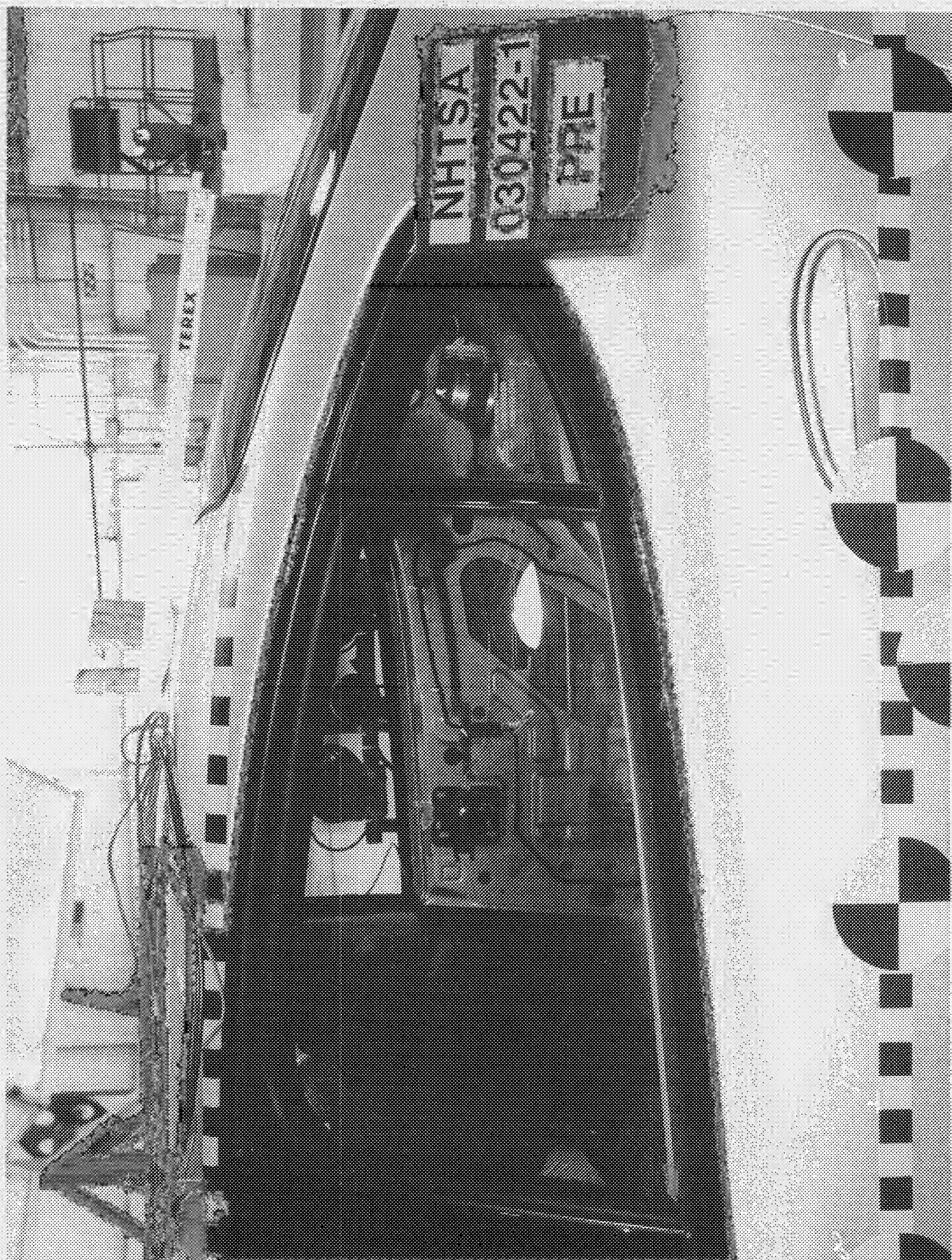


Figure A-27 Pre-Test Left View of Rear SID-H3

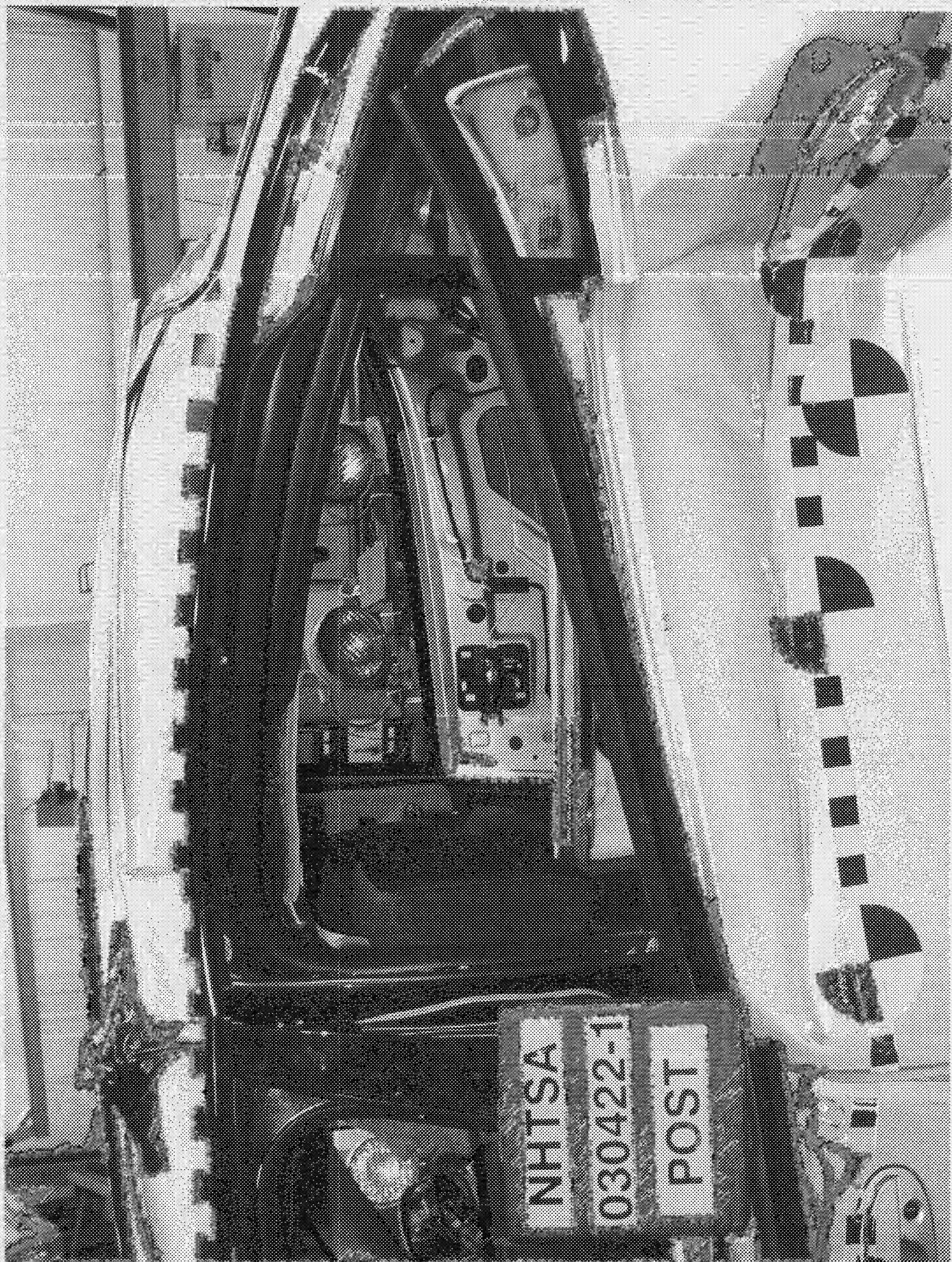


Figure A-28 Post-Test Left View of Rear SID-H3

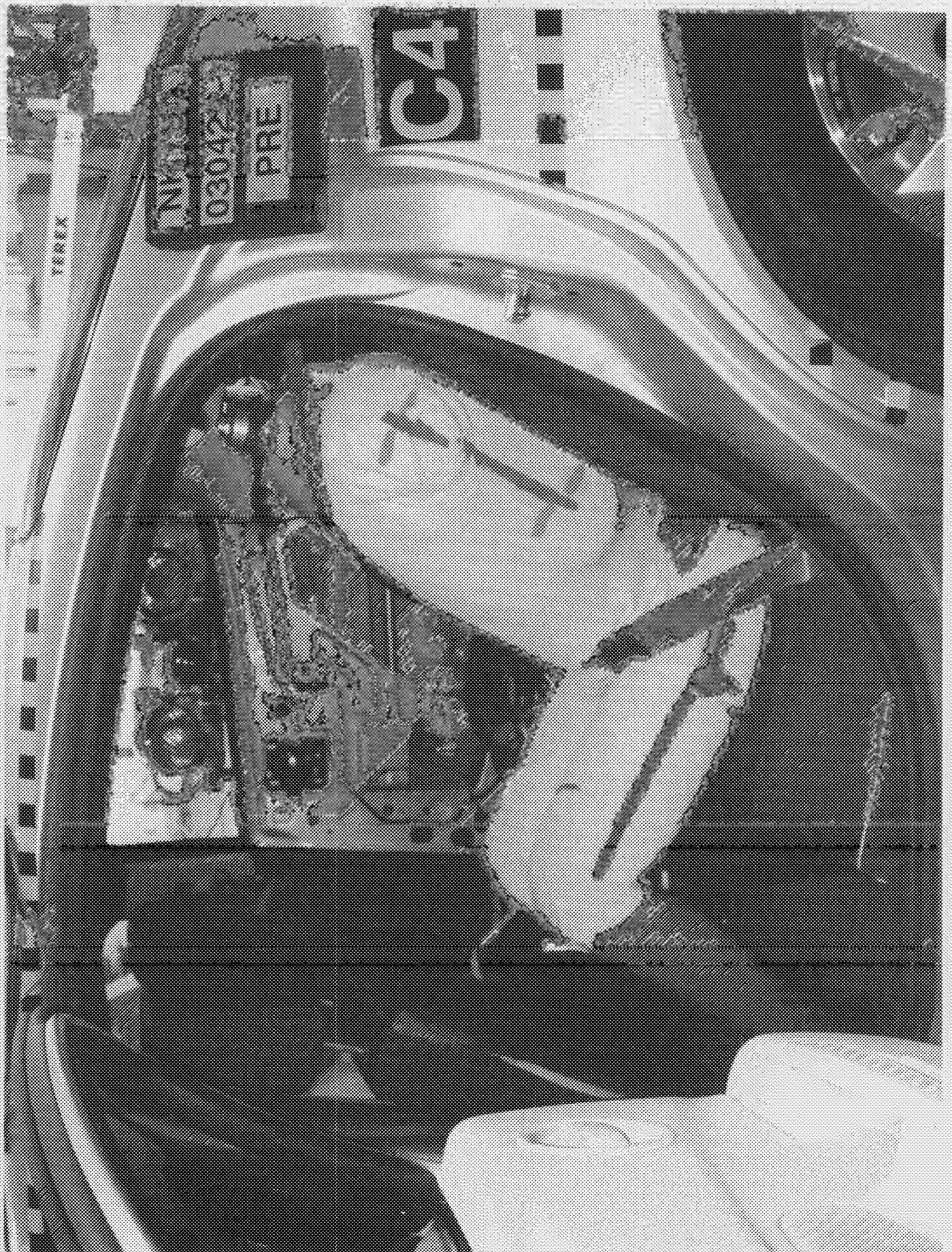


Figure A-29 Pre-Test Left of Rear SID-H3 and Belt Position



Figure A-30 Pre-Test Left View of Rear SID-H3 and Door Clearance

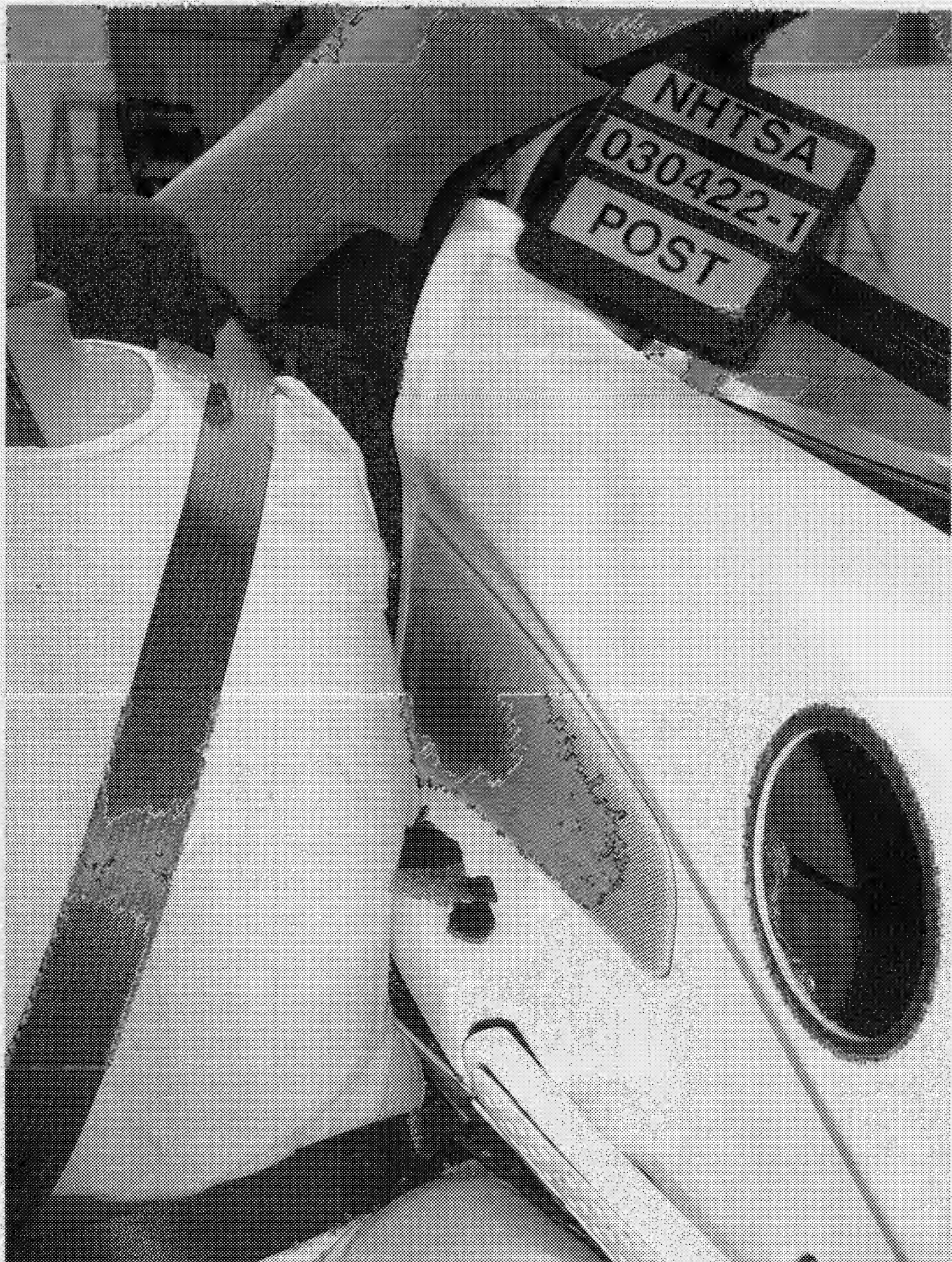


Figure A-31 Post-Test Left View of Rear SID-H3 and Door Clearance

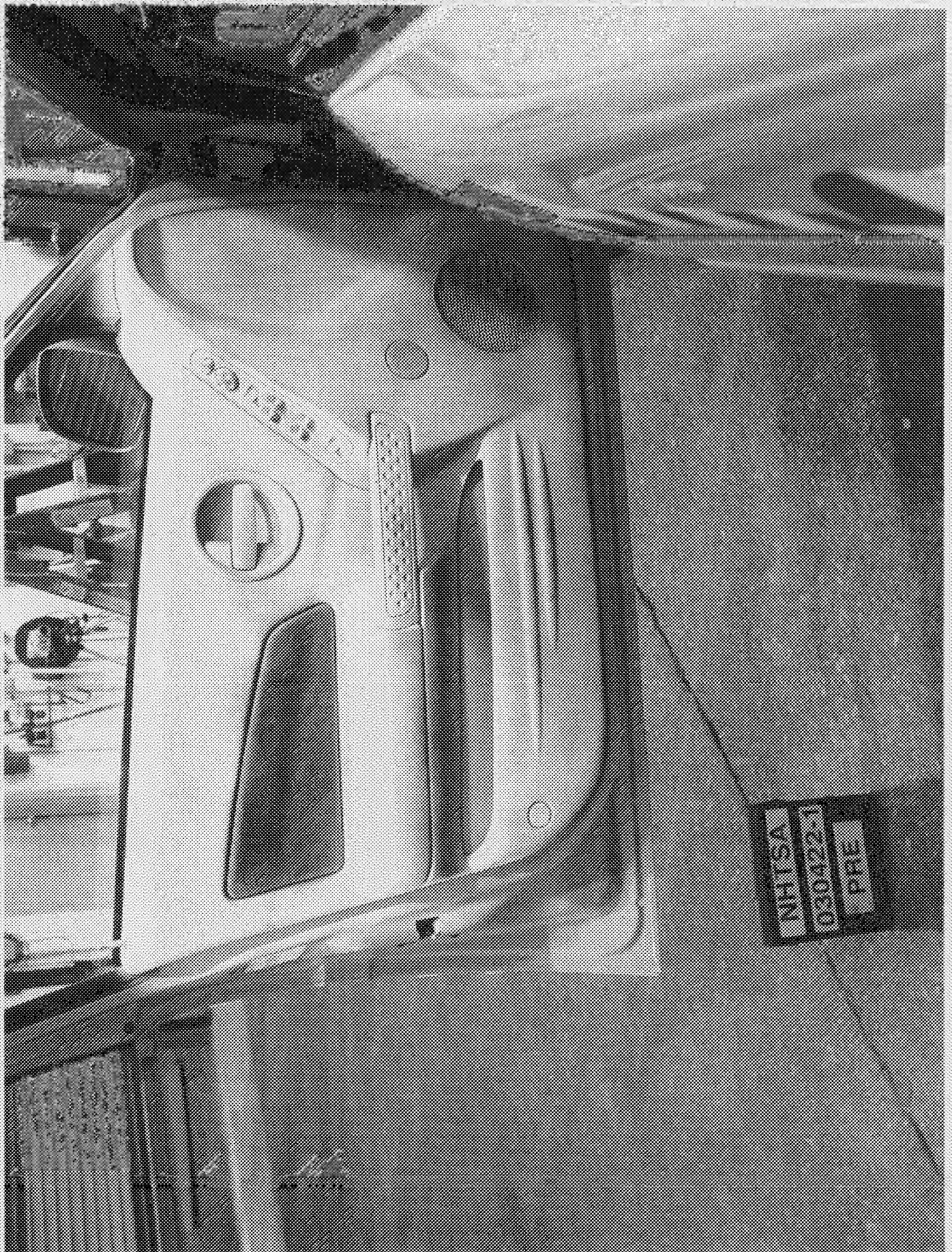


Figure A-32 Pre-Test Interior of Front Door



Figure A-33 Post-Test Interior of Front Door Showing SID-H3 Impact Locations



Figure A-34 Post-Test Front SID-H3 Contact

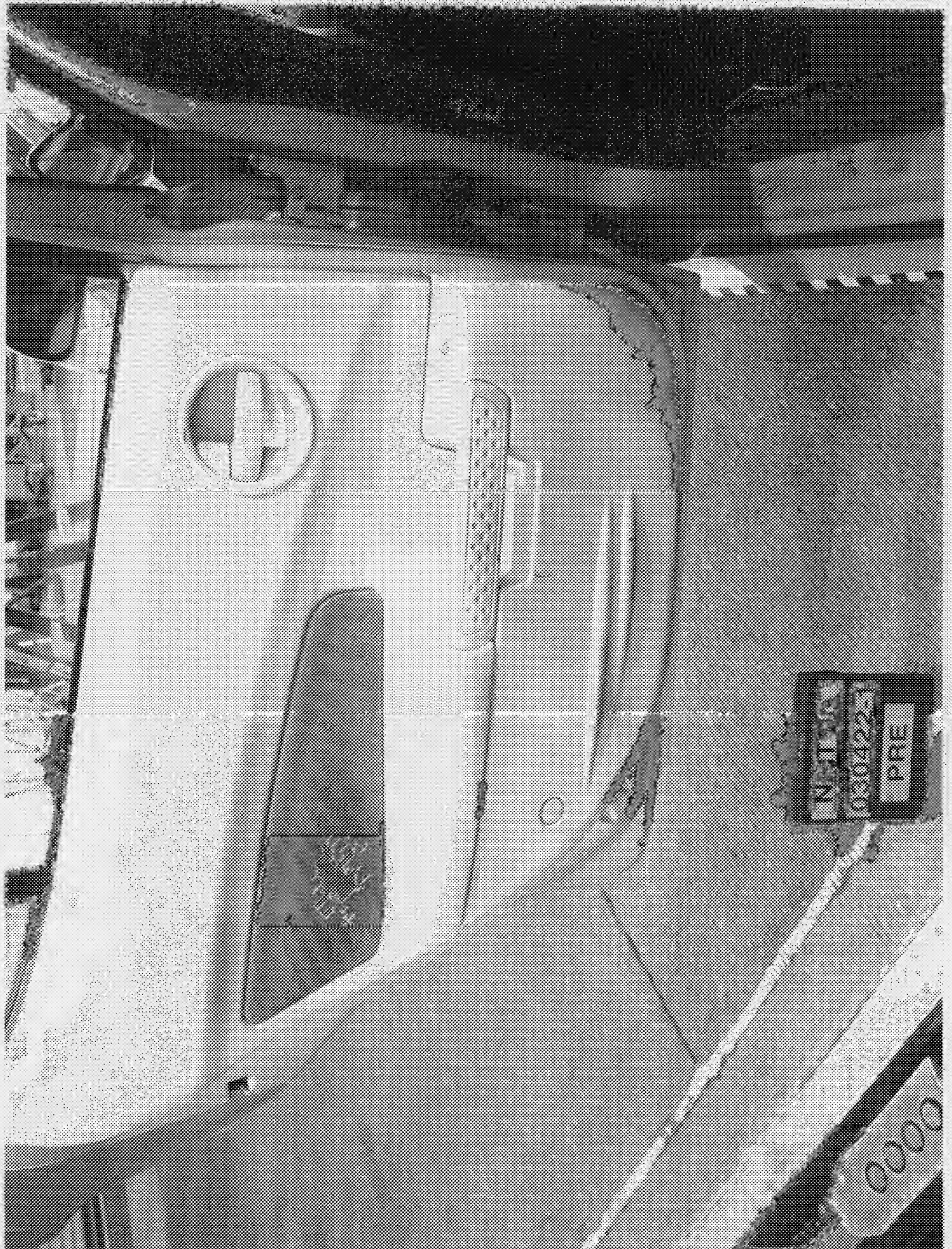


Figure A-35 Pre-Test Interior of Rear Door

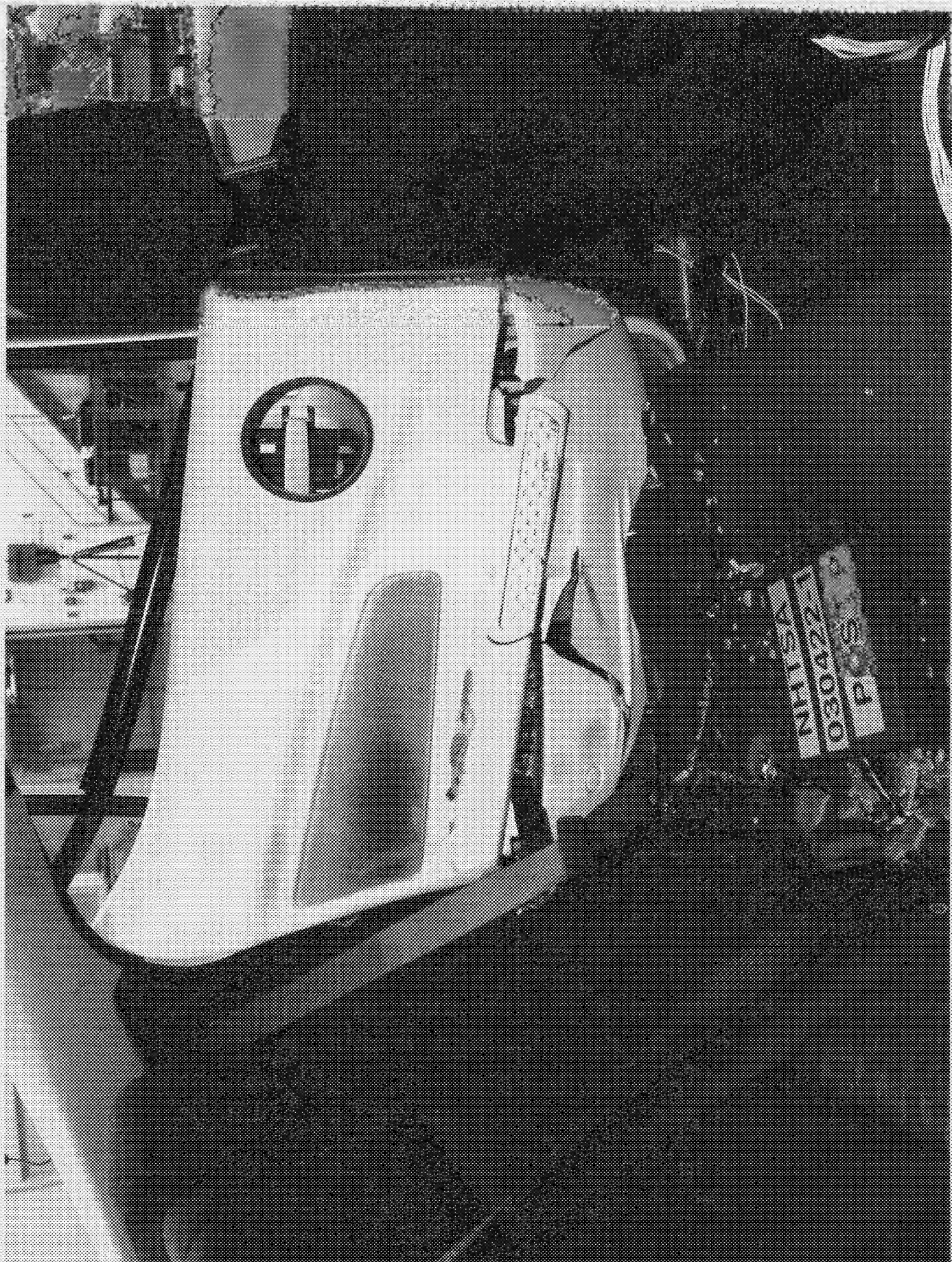


Figure A-36 Post-Test Interior of Rear Door Showing SID-H3 Impact Locations

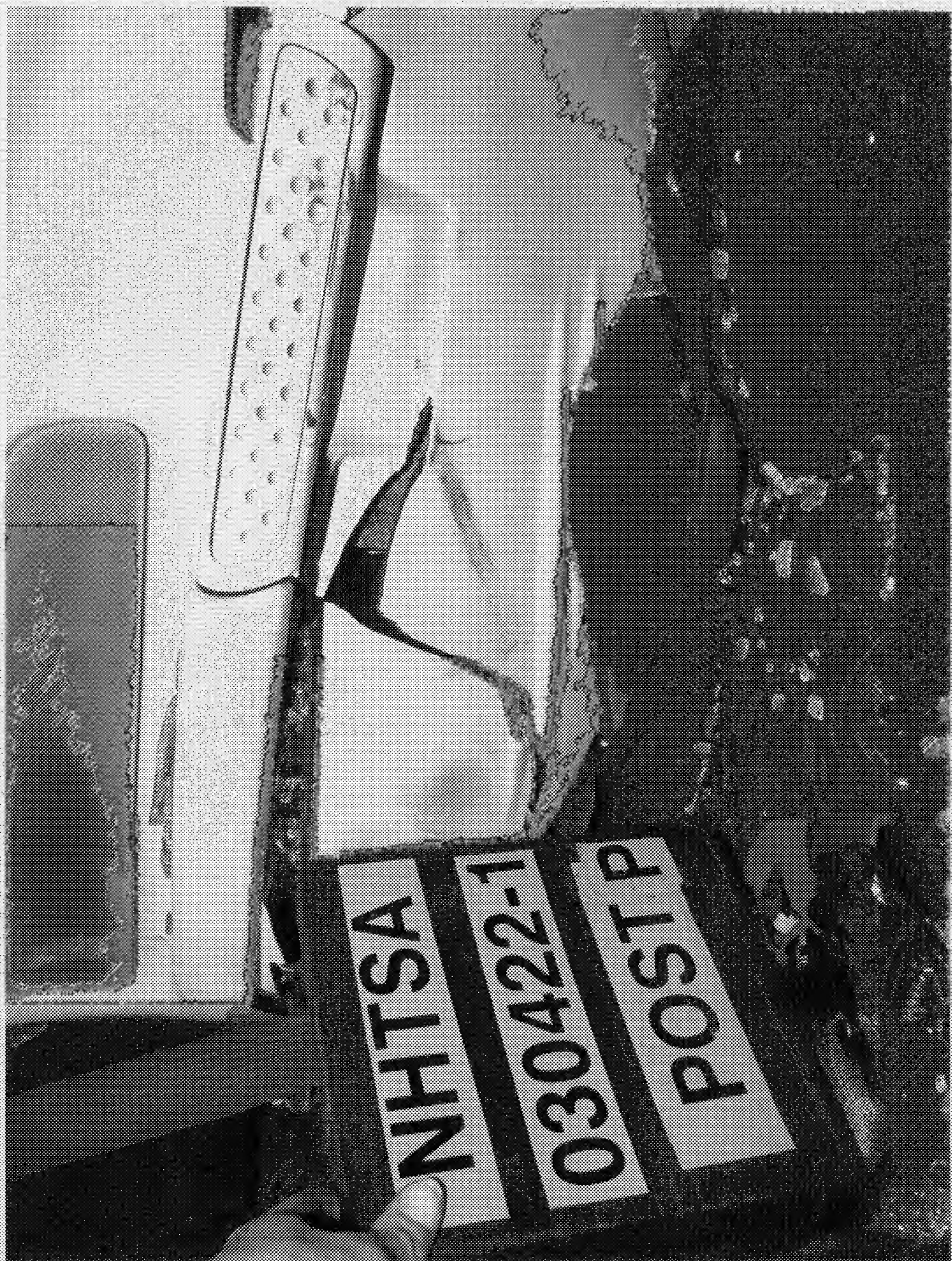


Figure A-37 Post-Test Rear SID-H3 Contact - View 1



Figure A-38 Post-Test Rear SID-H3 Contact - View 2

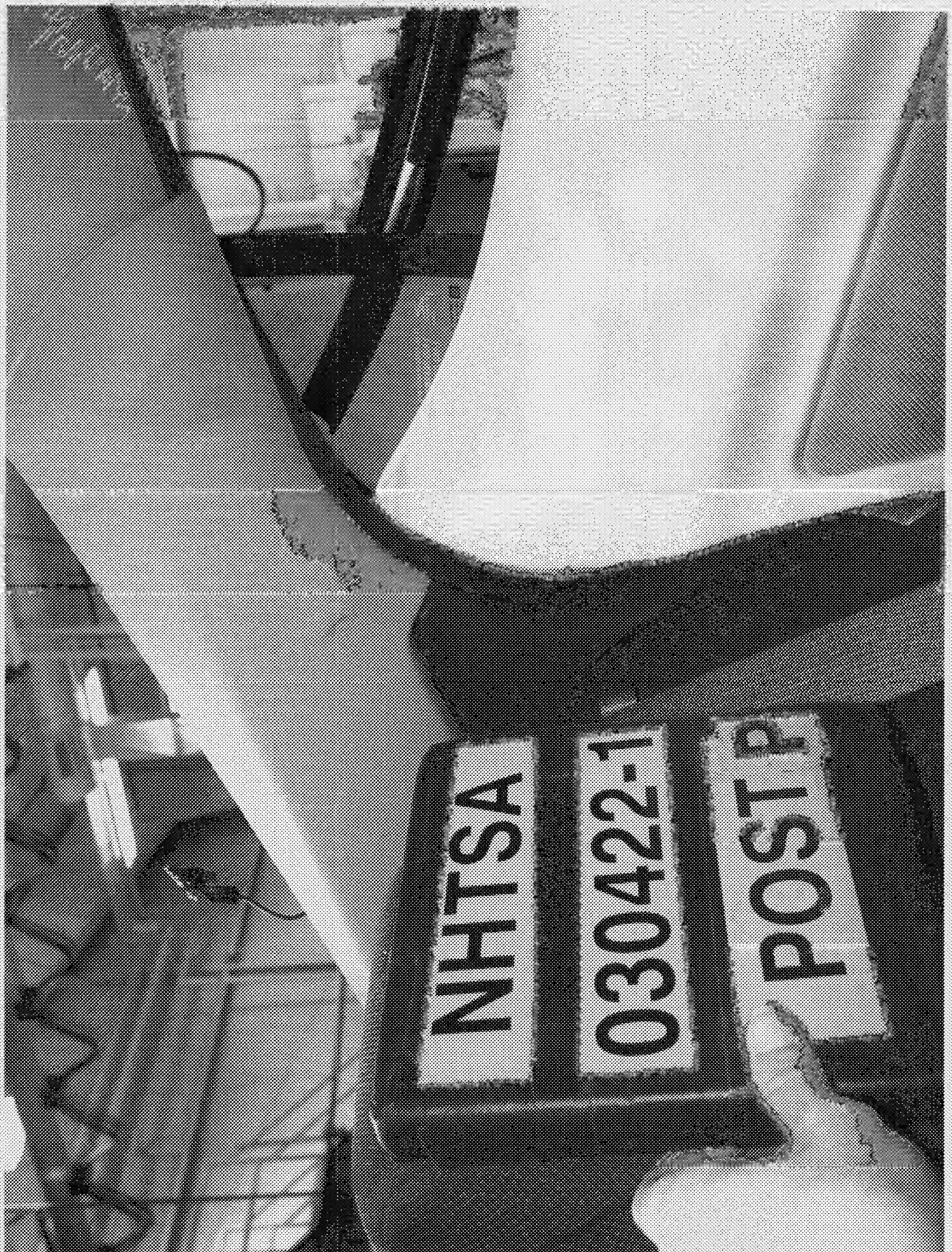


Figure A-39 Post-Test Rear SID-H3 Contact - View 3



Figure A-40 Post-Test Rear SID-H3 Contact - View 4

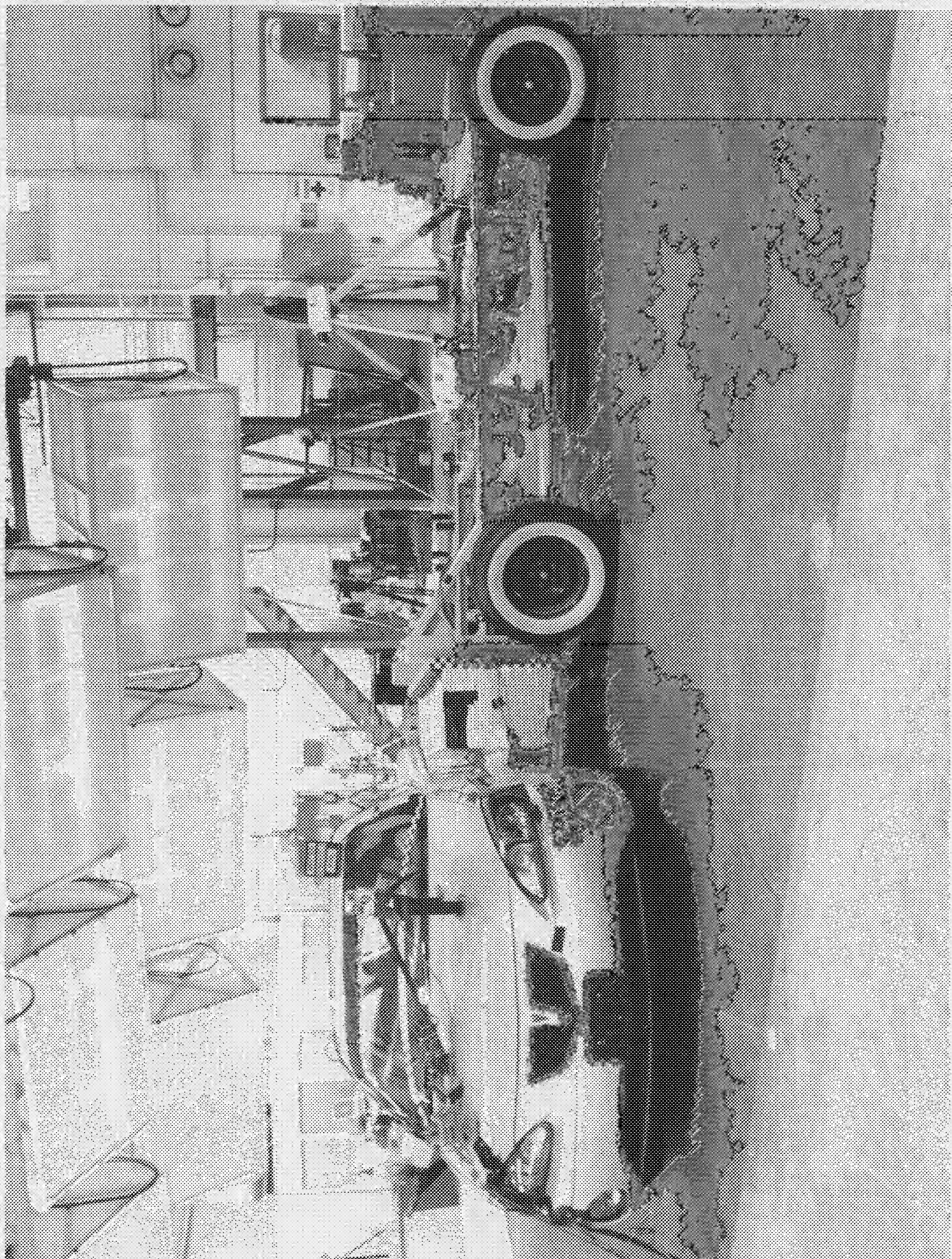


Figure A-41 Pre-Test Left Side View of MDB With Impactor Face in Position

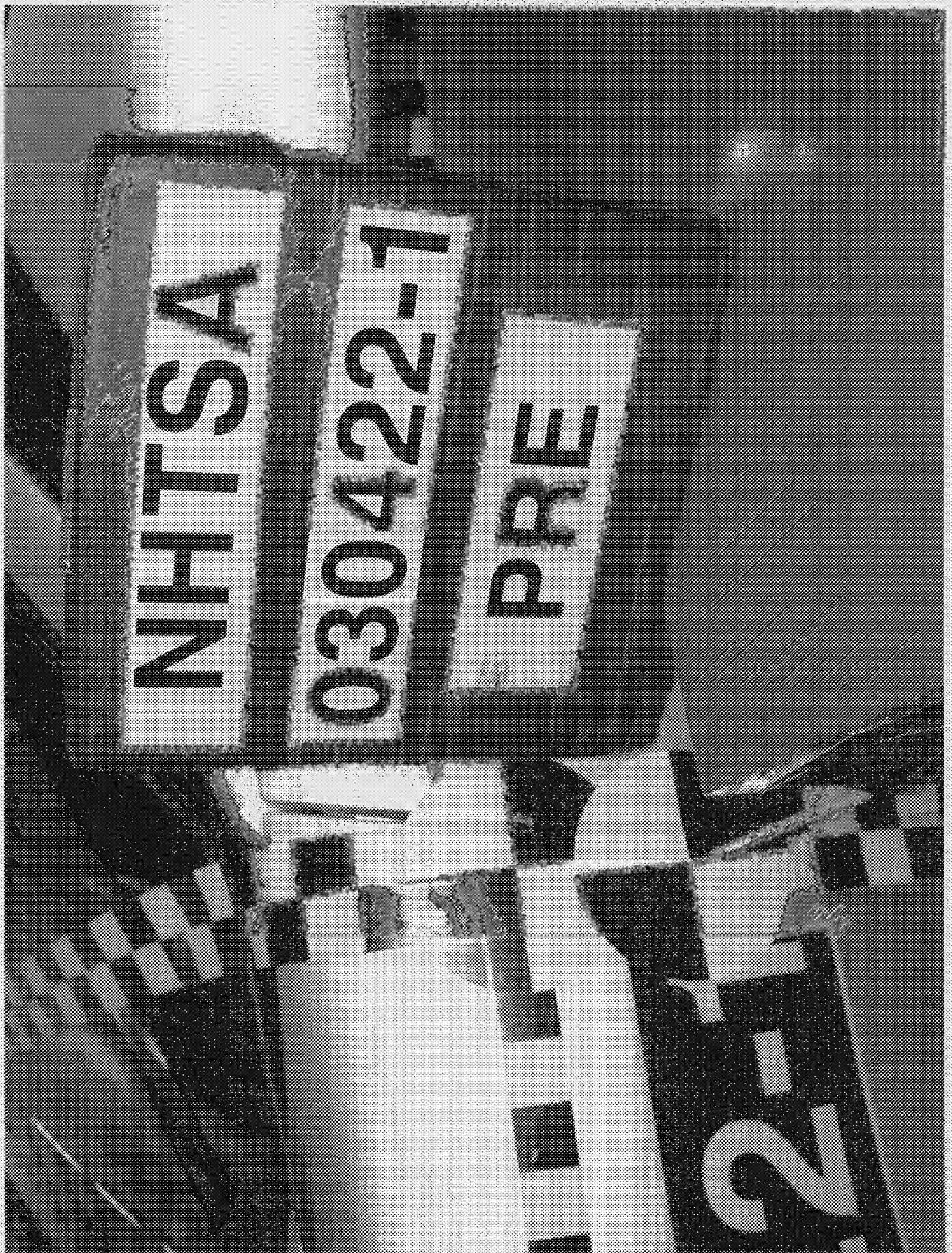


Figure A-42 Pre-Test Primary Impact Point View



Figure A-43 Post-Test Primary Impact Point View

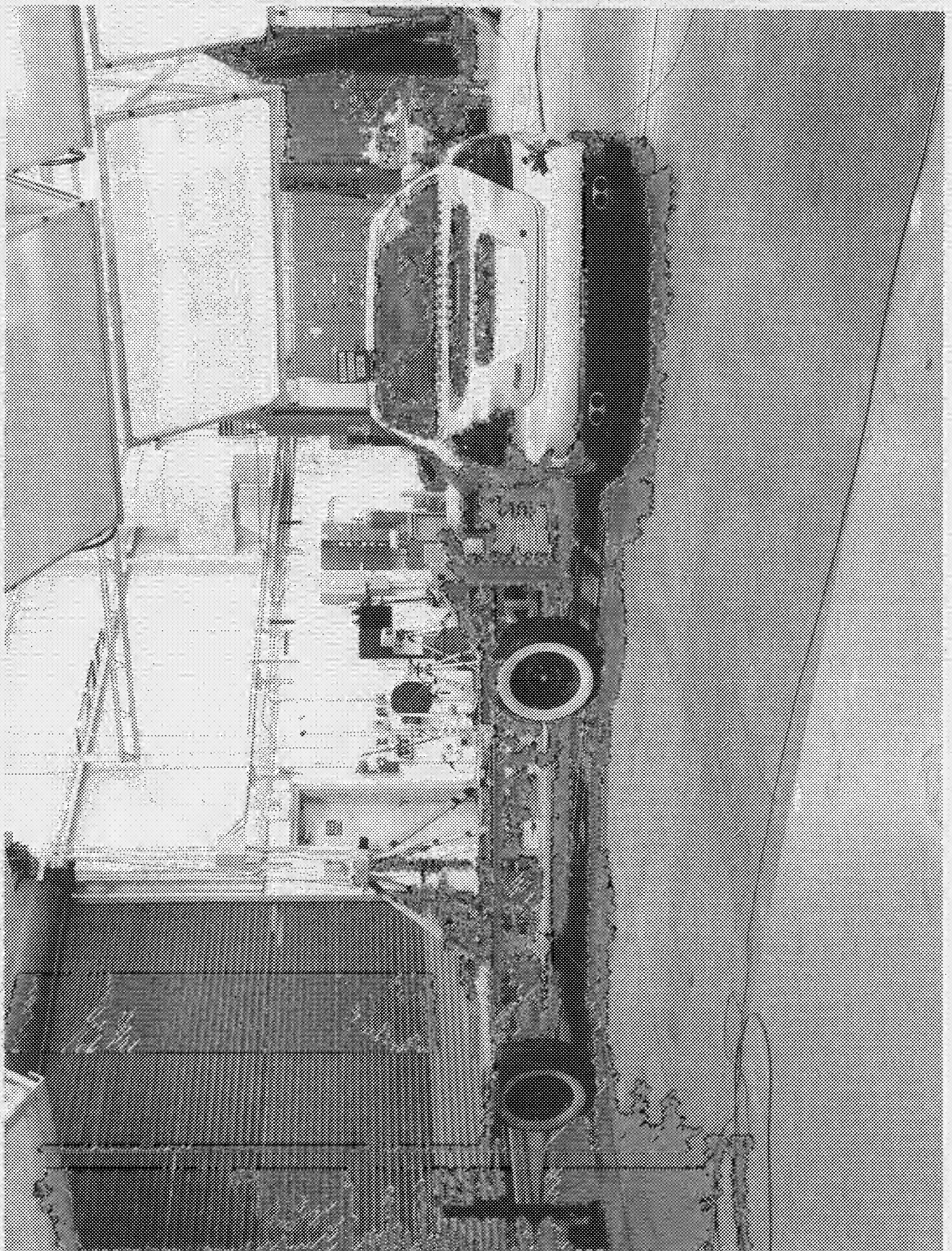


Figure A-44 Pre-Test Right Side View of MDB With Impactor Face in Position



Figure A-45 Pre-Test Secondary Impact Point View

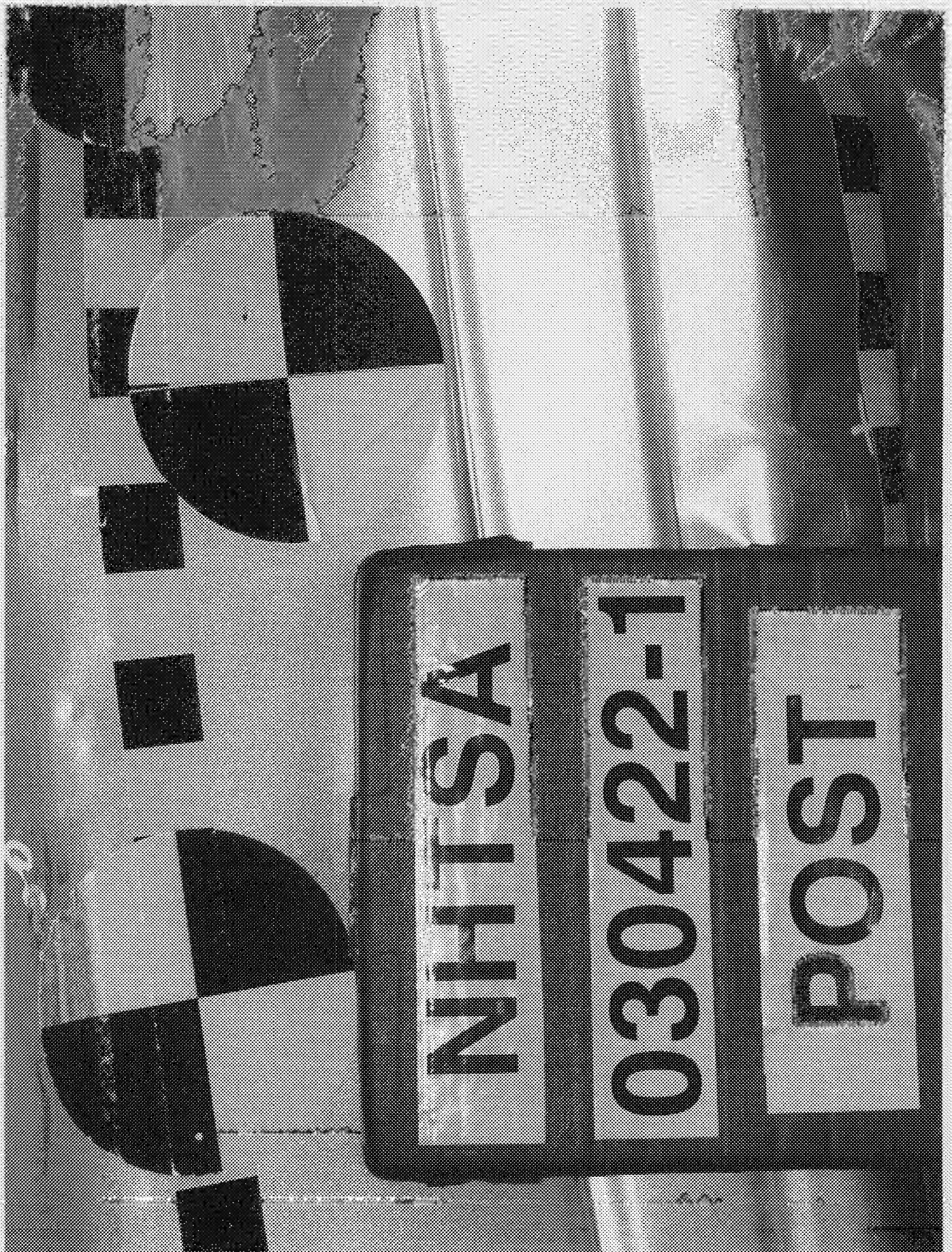


Figure A-46 Post-Test Secondary Impact Point View



MFD BY GENERAL MOTORS OF CANADA LTD.

DATE
02/03

GVWR
2005 KG
4421 LB

GAWR FRT
1100 KG
2426 LB

GAWR RR
905 KG
1995 LB

**THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL MOTOR
VEHICLE SAFETY, BUMPER, AND THEFT PREVENTION STANDARDS IN
EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.**

2G2WP522041100776

TYPE: PASS CAR



GM

TIRE - LOADING INFORMATION

OCCUPANTS				VEHICLE CAP. WT.	
FRT.	CTR.	RR.	TOTAL	KG	LBS
2	0	3	5	416	917

MAX. LOADING @ GVWR SAME AS VEHICLE CAPACITY WEIGHT.

2G2WP522041100776

MODEL: WP69 WAJ

	TIRE SIZE	SPEED RTG	COLD TIRE PRESSURE
FRT	P225/60R16	S	210KPA(30PSI)
RR	P225/60R16	S	210KPA(30PSI)
SPA	T125/70D16	M	420KPA(60PSI)

IF TIRES ARE HOT, ADD 28KPA(4PSI).

SEE OWNER'S MANUAL  FOR MORE INFORMATION.

SERVICE PA

2G2WP522

AG1 AK5
IPB JL9
PCI QD1
1SA 1SZ

BC/CC

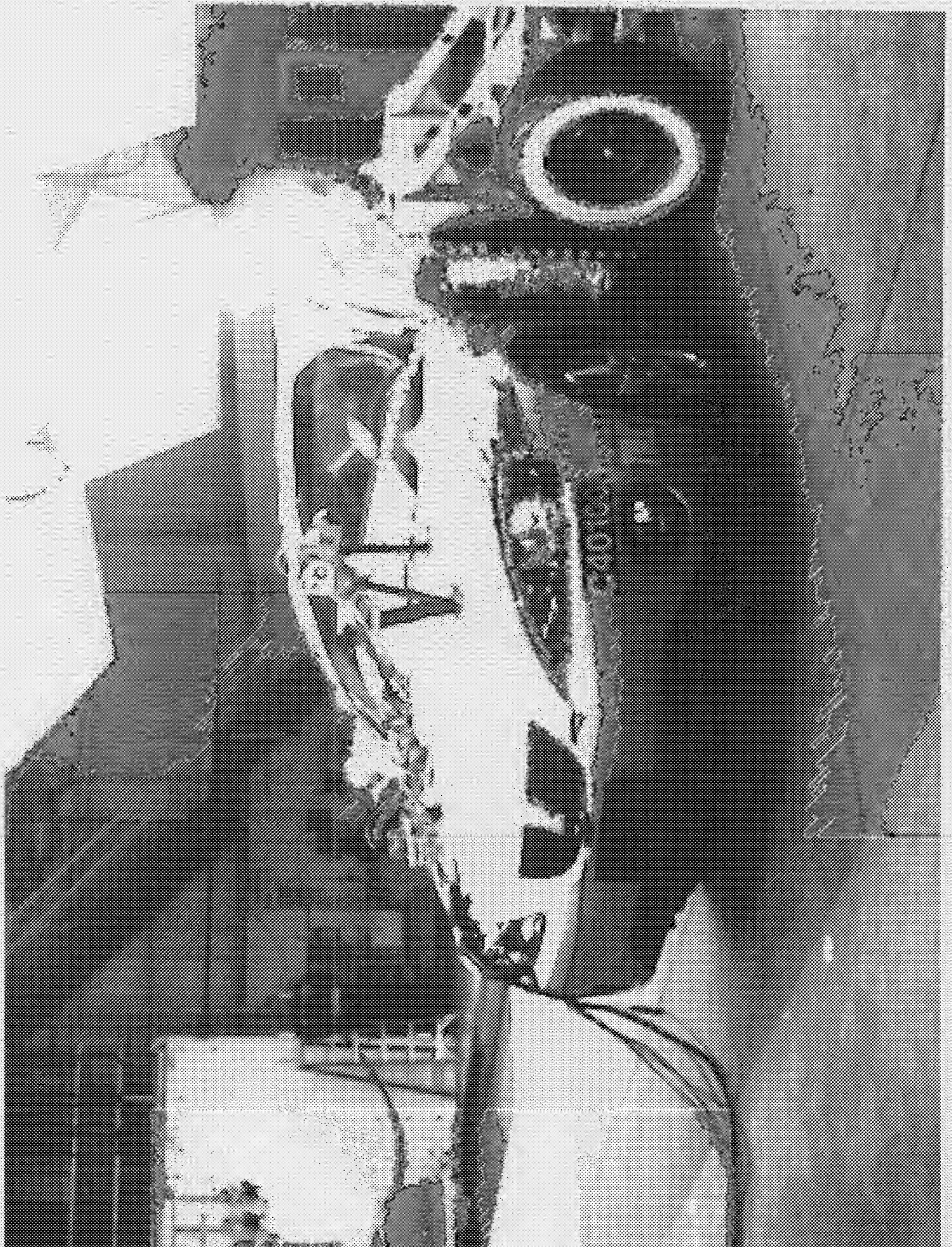


Figure A-49 Impact Event

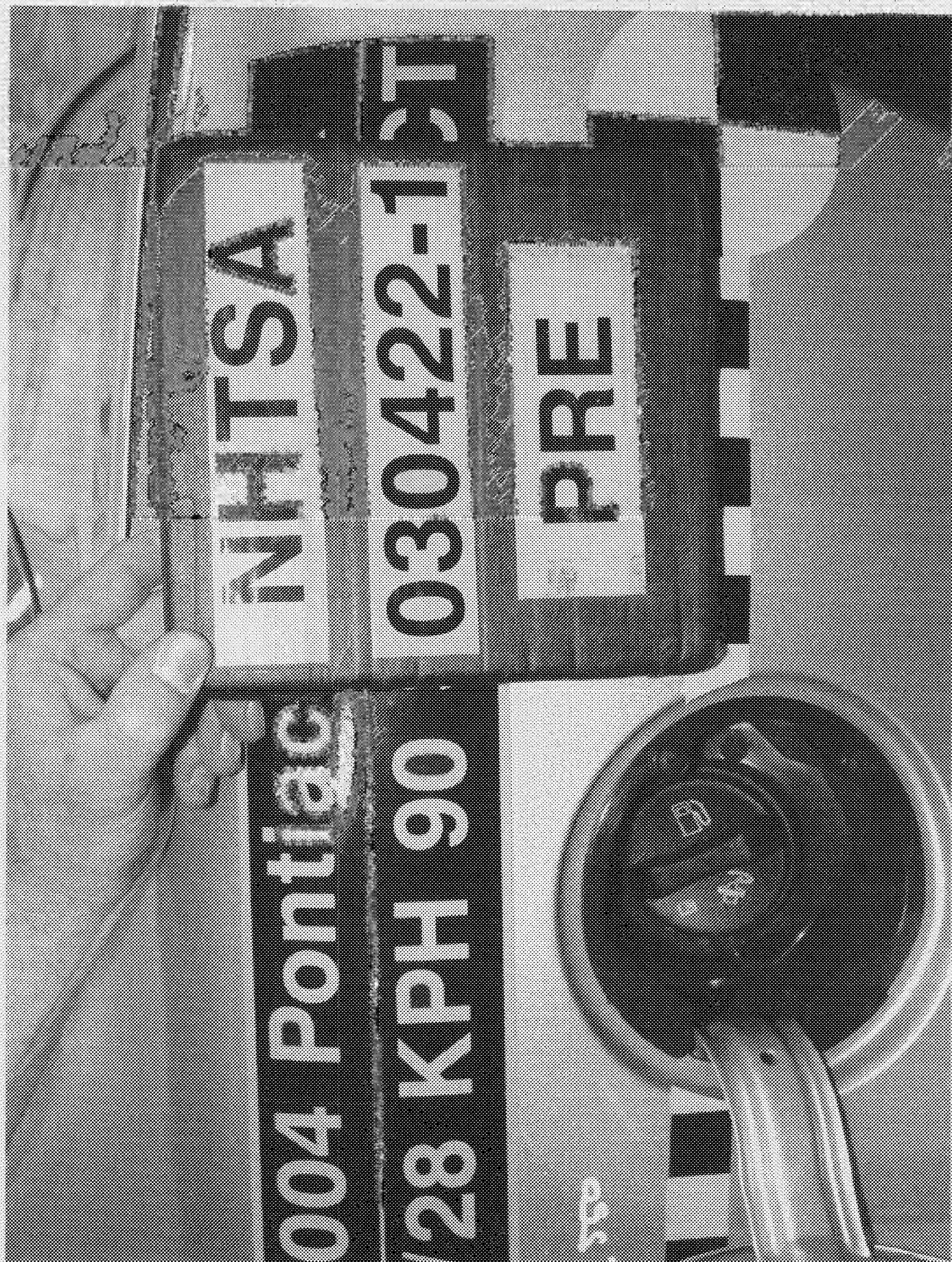


Figure A-50 Pre-Test Fuel Cap

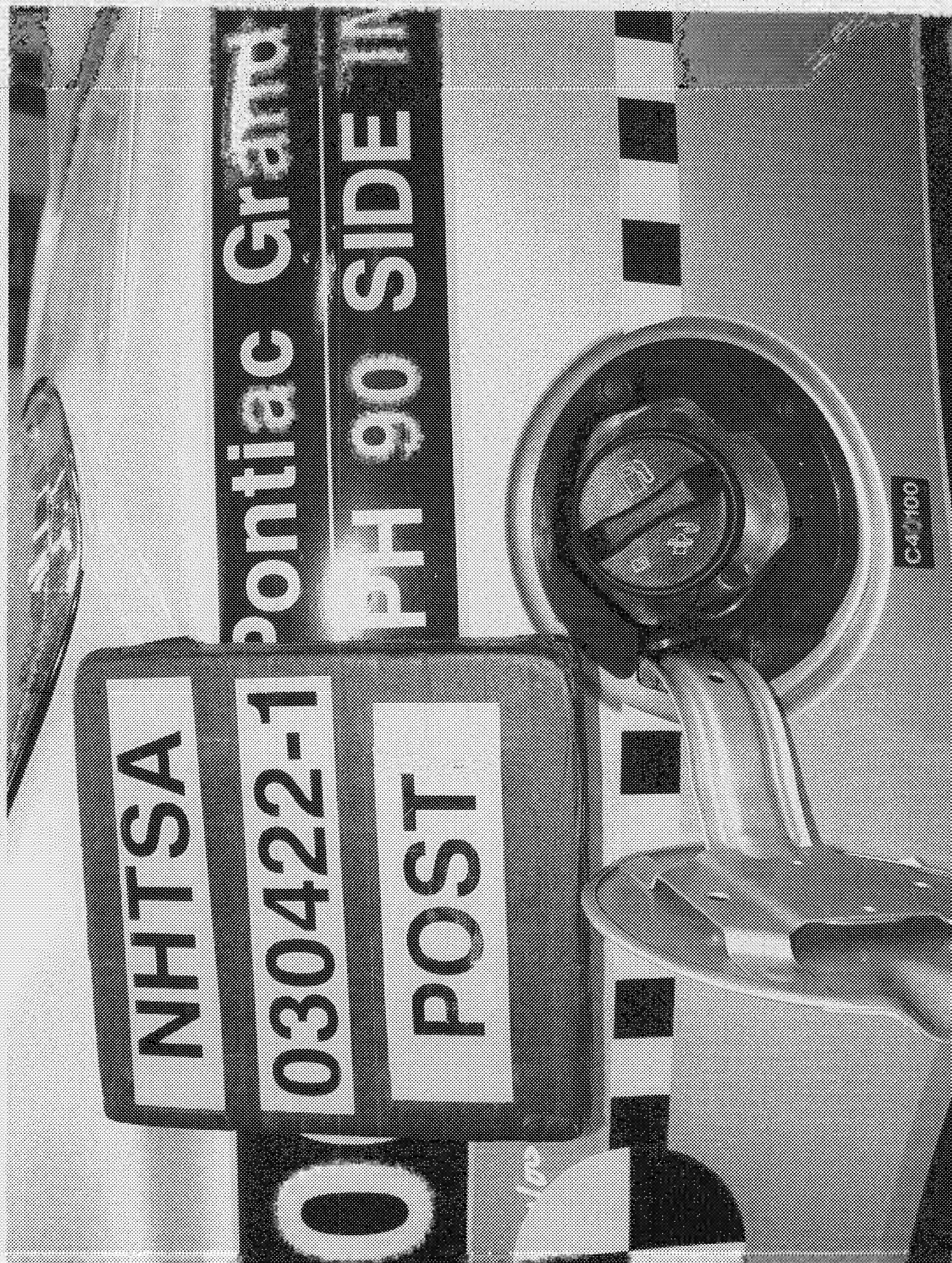


Figure A-51 Post-Test Fuel Cap



Figure A-52 FMVSS 301 Rollover View at 90°

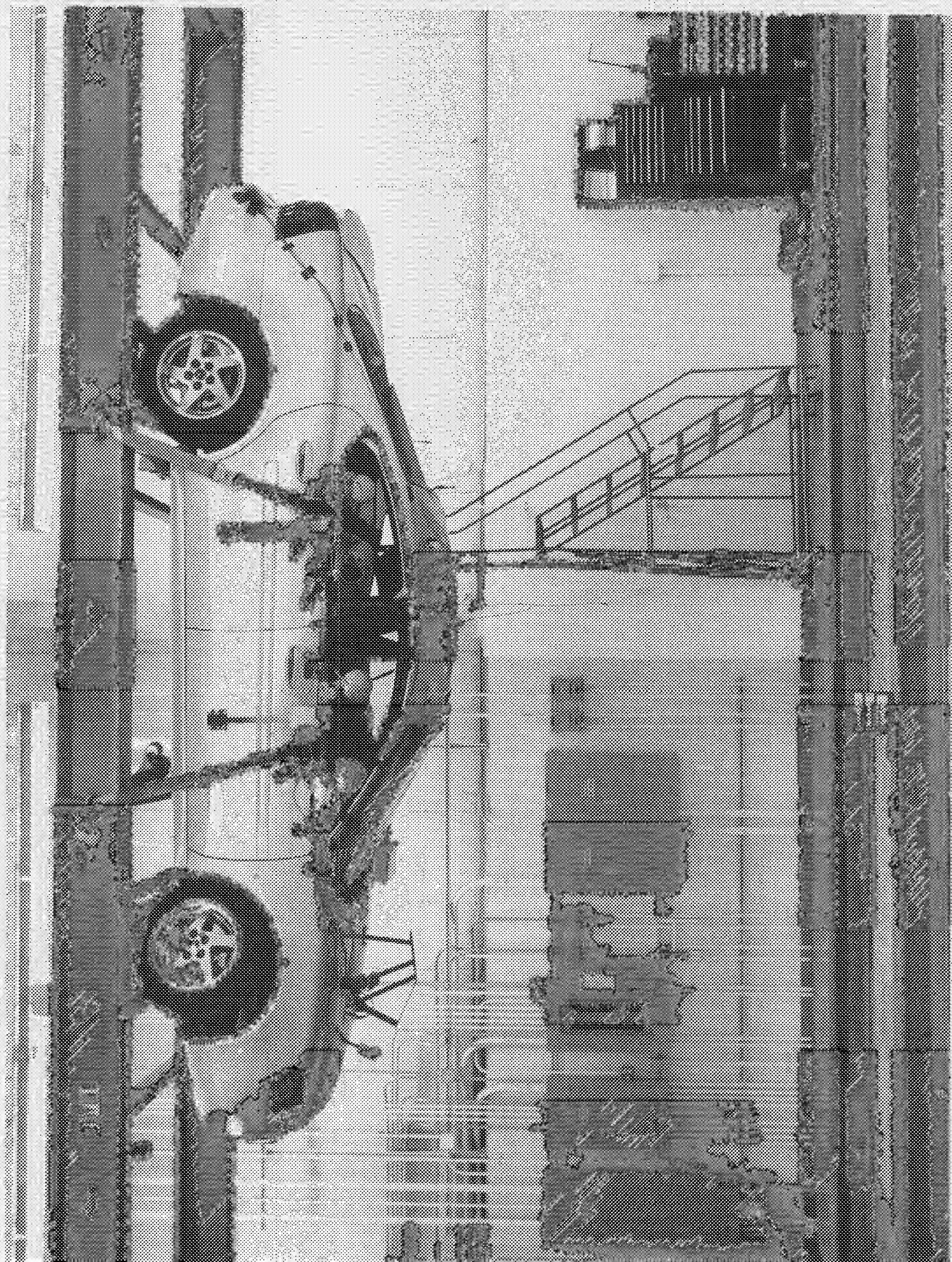


Figure A-53 FMVSS 301 Rollover View at 180°

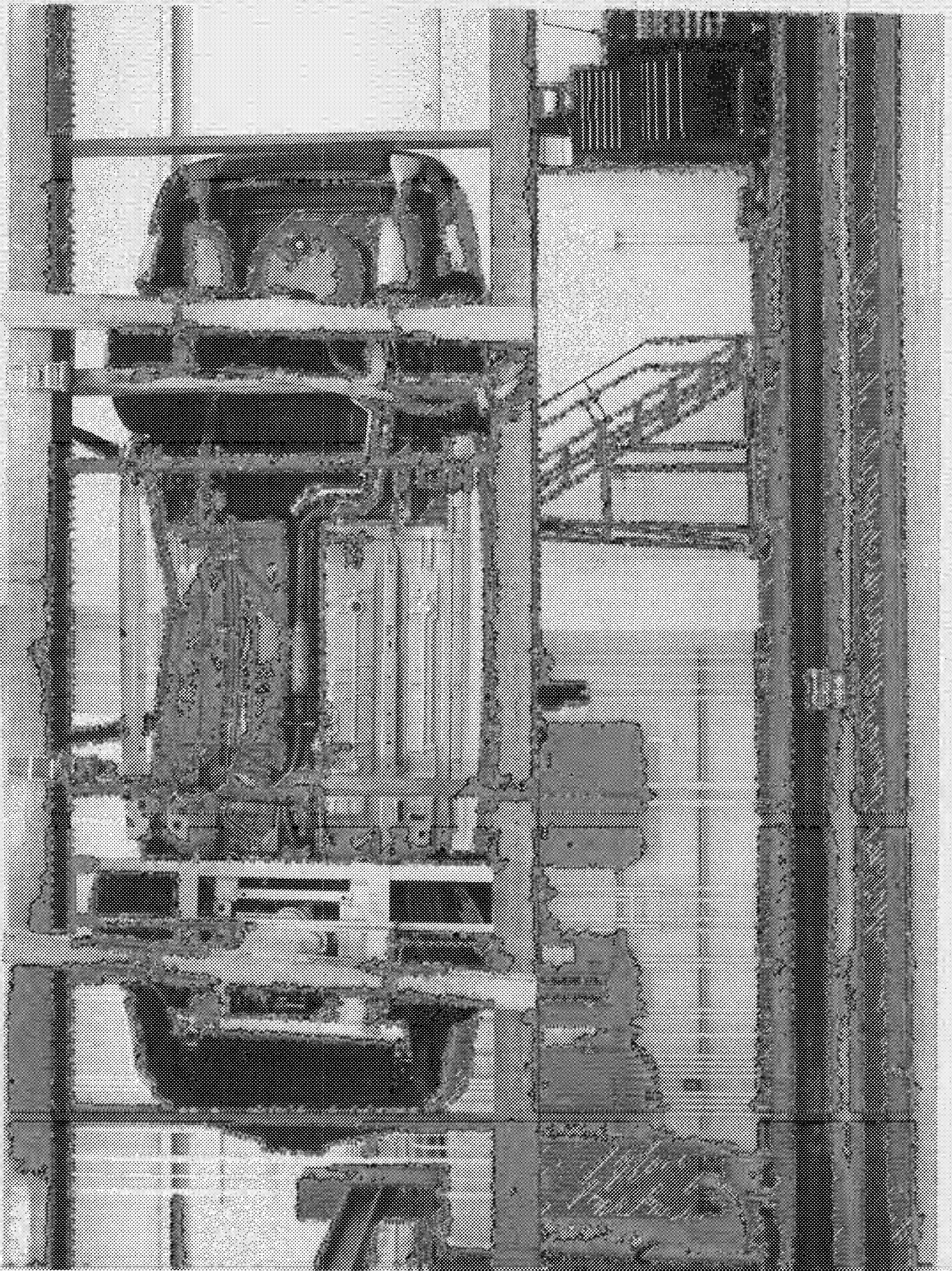


Figure A-54 FMVSS 301 Rollover View at 270°

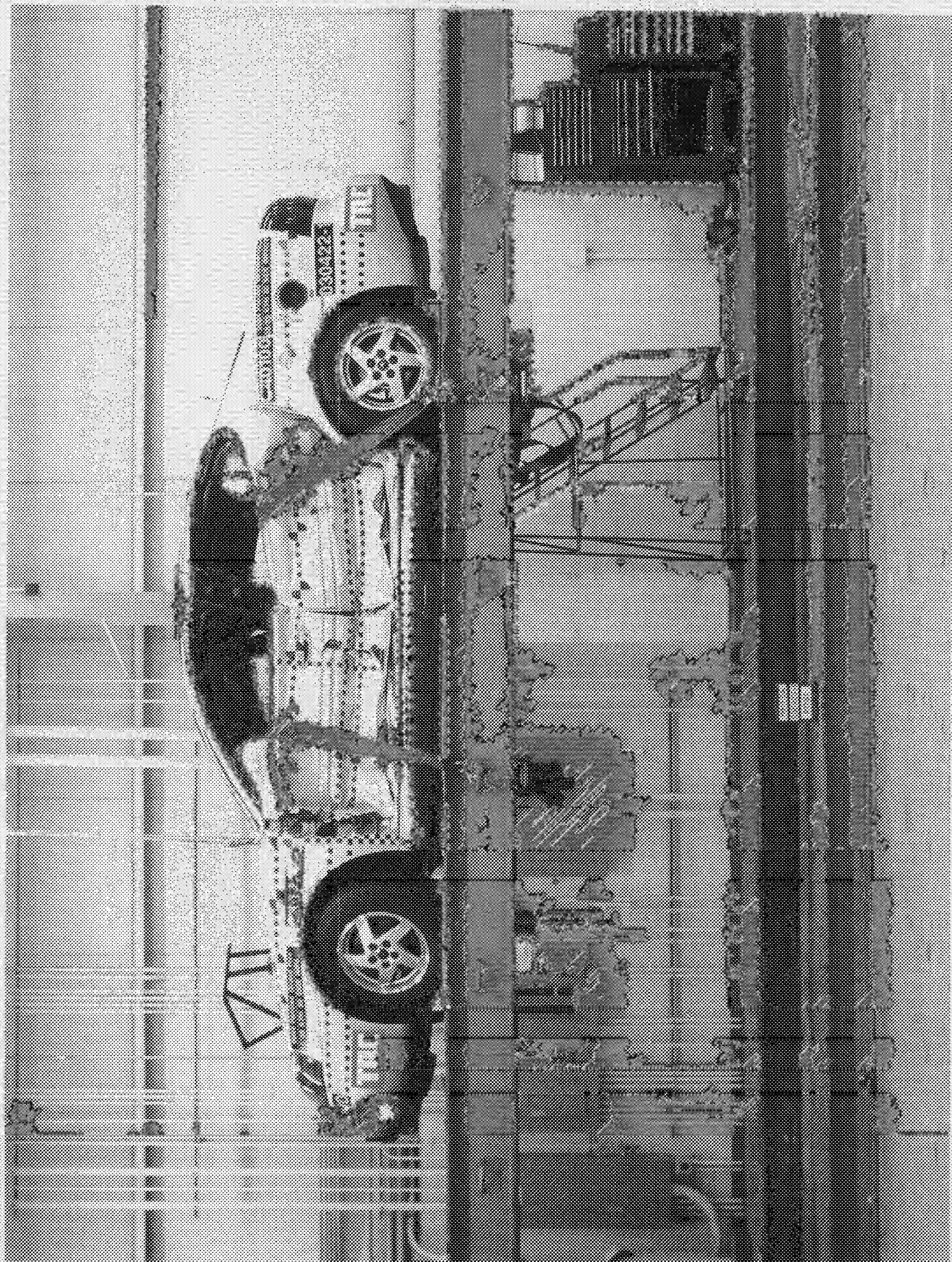


Figure A-55 FMVSS 301 Rollover View at 360°

Appendix B

Data Plots

Table of Data Plots

Driver and Passenger Dummy Instrumentation Plots

Acceleration Data - Filter Class 1000

Integration Data - Filter Class 180

Force Data - Filter Class 1000

Moment Data - Filter Class 600

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
1	Driver Head X-Axis Acceleration	B-10
2	Driver Head X-Axis Velocity	B-11
3	Driver Head Y-Axis Acceleration	B-12
4	Driver Head Y-Axis Velocity	B-13
5	Driver Head Z-Axis Acceleration	B-14
6	Driver Head Z-Axis Velocity	B-15
7	Driver Head Resultant Acceleration	B-16
8	Driver Neck X-Axis Shear Force	B-17
9	Driver Neck Y-Axis Shear Force	B-18
10	Driver Neck Z-Axis Axial Force	B-19
11	Driver Neck Moment about X Axis	B-20
12	Driver Neck Moment about Y Axis	B-21
13	Driver Neck Moment about Z Axis	B-22
14	Driver Neck Occipital Condyle Moment about X Axis	B-23
15	Driver Upper Rib Y-Axis Acceleration	B-24
16	Driver Upper Rib Y-Axis Velocity	B-25
17	Driver Lower Rib Y-Axis Acceleration	B-26
18	Driver Lower Rib Y-Axis Velocity	B-27
19	Driver Lower Spine Y-Axis Acceleration	B-28
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21	Driver Pelvis Y-Axis Acceleration	B-30
22	Driver Pelvis Y-Axis Velocity	B-31
23	Left Rear Passenger Head X-Axis Acceleration	B-32
24	Left Rear Passenger Head X-Axis Velocity	B-33
25	Left Rear Passenger Head Y-Axis Acceleration	B-34
26	Left Rear Passenger Head Y-Axis Velocity	B-35
27	Left Rear Passenger Head Z-Axis Acceleration	B-36

Table of Data Plots (Continued)

Driver and Passenger Dummy Instrumentation Plots (Continued)

Acceleration Data - Filter Class 1000

Integration Data - Filter Class 180

Force Data - Filter Class 1000

Moment Data - Filter Class 600

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
28	Left Rear Passenger Head Z-Axis Velocity	B-37
29	Left Rear Passenger Head Resultant Acceleration	B-38
30	Left Rear Passenger Neck X-Axis Shear Force	B-39
31	Left Rear Passenger Neck Y-Axis Shear Force	B-40
32	Left Rear Passenger Neck Z-Axis Axial Force	B-41
33	Left Rear Passenger Neck Moment about X Axis	B-42
34	Left Rear Passenger Neck Moment about Y Axis	B-43
35	Left Rear Passenger Neck Moment about Z Axis	B-44
36	Left Rear Passenger Neck Occipital Condyle Moment about X Axis	B-45
37	Left Rear Passenger Upper Rib Y-Axis Acceleration	B-46
38	Left Rear Passenger Upper Rib Y-Axis Velocity	B-47
39	Left Rear Passenger Lower Rib Y-Axis Acceleration	B-48
40	Left Rear Passenger Lower Rib Y-Axis Velocity	B-49
41	Left Rear Passenger Lower Spine Y-Axis Acceleration	B-50
42	Left Rear Passenger Lower Spine Y-Axis Velocity	B-51
43	Left Rear Passenger Pelvis Y-Axis Acceleration	B-52
44	Left Rear Passenger Pelvis Y-Axis Velocity	B-53

Driver and Passenger Dummy Instrumentation Plots

Acceleration Data - Filter Class 1000 - Redundant

Integration Data - Filter Class 180 - Redundant

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46	Driver Head X-Axis Redundant Velocity	B-56
47	Driver Head Y-Axis Redundant Acceleration	B-57
48	Driver Head Y-Axis Redundant Velocity	B-58

Table of Data Plots (Continued)

Driver and Passenger Dummy Instrumentation Plots (Continued)

Acceleration Data - Filter Class 1000 - Redundant

Integration Data - Filter Class 180 - Redundant

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
49	Driver Head Z-Axis Redundant Acceleration	B-59
50	Driver Head Z-Axis Redundant Velocity	B-60
51	Driver Head Resultant Redundant Acceleration	B-61
52	Driver Upper Rib Y-Axis Redundant Acceleration	B-62
53	Driver Upper Rib Y-Axis Redundant Velocity	B-63
54	Driver Lower Rib Y-Axis Redundant Acceleration	B-64
55	Driver Lower Rib Y-Axis Redundant Velocity	B-65
56	Driver Lower Spine Y-Axis Redundant Acceleration	B-66
57	Driver Lower Spine Y-Axis Redundant Velocity	B-67
58	Driver Pelvis Y-Axis Redundant Acceleration	B-68
59	Driver Pelvis Y-Axis Redundant Velocity	B-69
60	Left Rear Passenger Head X-Axis Redundant Acceleration	B-70
61	Left Rear Passenger Head X-Axis Redundant Velocity	B-71
62	Left Rear Passenger Head Y-Axis Redundant Acceleration	B-72
63	Left Rear Passenger Head Y-Axis Redundant Velocity	B-73
64	Left Rear Passenger Head Z-Axis Redundant Acceleration	B-74
65	Left Rear Passenger Head Z-Axis Redundant Velocity	B-75
66	Left Rear Passenger Head Resultant Redundant Acceleration	B-76
67	Left Rear Passenger Upper Rib Y-Axis Redundant Acceleration	B-77
68	Left Rear Passenger Upper Rib Y-Axis Redundant Velocity	B-78
69	Left Rear Passenger Lower Rib Y-Axis Redundant Acceleration	B-79
70	Left Rear Passenger Lower Rib Y-Axis Redundant Velocity	B-80
71	Left Rear Passenger Lower Spine Y-Axis Redundant Acceleration	B-81
72	Left Rear Passenger Lower Spine Y-Axis Redundant Velocity	B-82
73	Left Rear Passenger Pelvis Y-Axis Redundant Acceleration	B-83
74	Left Rear Passenger Pelvis Y-Axis Redundant Velocity	B-84

Table of Data Plots (Continued)
Test Vehicle Instrumentation Plots
Acceleration Data - Filter Class 60
Integration Data - Filter Class 180

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75	Right Side Sill at Front Seat X-Axis Acceleration	B-86
76	Right Side Sill at Front Seat X-Axis Velocity	B-87
77	Right Side Sill at Front Seat Y-Axis Acceleration	B-88
78	Right Side Sill at Front Seat Y-Axis Velocity	B-89
79	Right Side Sill at Front Seat Z-Axis Acceleration	B-90
80	Right Side Sill at Front Seat Z-Axis Velocity	B-91
81	Right Side Sill at Front Seat Resultant Acceleration	B-92
82	Right Side Sill at Rear Seat X-Axis Acceleration	B-93
83	Right Side Sill at Rear Seat X-Axis Velocity	B-94
84	Right Side Sill at Rear Seat Y-Axis Acceleration	B-95
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86	Right Side Sill at Rear Seat Z-Axis Acceleration	B-97
87	Right Side Sill at Rear Seat Z-Axis Velocity	B-98
88	Right Side Sill at Rear Seat Resultant Acceleration	B-99
89	Rear Floorpan Above Axle X-Axis Acceleration	B-100
90	Rear Floorpan Above Axle X-Axis Velocity	B-101
91	Rear Floorpan Above Axle Y-Axis Acceleration	B-102
92	Rear Floorpan Above Axle Y-Axis Velocity	B-103
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94	Rear Floorpan Above Axle Z-Axis Velocity	B-105
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96	Left Side Sill at Front Seat Y-Axis Acceleration	B-107
97	Left Side Sill at Front Seat Y-Axis Velocity	B-108
98	Left Side Sill at Front Seat Y-Axis Displacement	B-109
99	Left Side Sill at Rear Seat Y-Axis Acceleration	B-110
100	Left Side Sill at Rear Seat Y-Axis Velocity	B-111
101	Left Side Sill at Rear Seat Y-Axis Displacement	B-112
102	Right Rear Occupant Compartment Y-Axis Acceleration	B-113
103	Right Rear Occupant Compartment Y-Axis Velocity	B-114

Table of Data Plots (Continued)
Test Vehicle Instrumentation Plots (Continued)
Acceleration Data - Filter Class 60
Integration Data - Filter Class 180

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
104	Right Rear Occupant Compartment Y-Axis Displacement	B-115
105	Left Lower A-Post Y-Axis Acceleration	B-116
106	Left Lower A-Post Y-Axis Velocity	B-117
107	Left Middle A-Post Y-Axis Acceleration	B-118
108	Left Middle A-Post Y-Axis Velocity	B-119
109	Left Lower B-Post Y-Axis Acceleration	B-120
110	Left Lower B-Post Y-Axis Velocity	B-121
111	Left Middle B-Post Y-Axis Acceleration	B-122
112	Left Middle B-Post Y-Axis Velocity	B-123
113	Left Front Seat Track Y-Axis Acceleration	B-124
114	Left Front Seat Track Y-Axis Velocity	B-125
115	Left Rear Seat Track Y-Axis Acceleration	B-126
116	Left Rear Seat Track Y-Axis Velocity	B-127
117	Vehicle Center of Gravity X-Axis Acceleration	B-128
118	Vehicle Center of Gravity X-Axis Velocity	B-129
119	Vehicle Center of Gravity Y-Axis Acceleration	B-130
120	Vehicle Center of Gravity Y-Axis Velocity	B-131
121	Vehicle Center of Gravity Z-Axis Acceleration	B-132
122	Vehicle Center of Gravity Z-Axis Velocity	B-133
123	Vehicle Center of Gravity Resultant Acceleration	B-134

MDB Instrumentation Plots
Acceleration Data - Filter Class 60
Integration Data - Filter Class 180

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
124	MDB Center of Gravity X-Axis Acceleration	B-136
125	MDB Center of Gravity X-Axis Velocity	B-137
126	MDB Center of Gravity Y-Axis Acceleration	B-138

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MDB Instrumentation Plots (Continued)

Acceleration Data - Filter Class 60

Integration Data - Filter Class 180

Contact Data - Filter Class 1000

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
127	MDB Center of Gravity Y-Axis Velocity	B-139
128	MDB Center of Gravity Z-Axis Acceleration	B-140
129	MDB Center of Gravity Z-Axis Velocity	B-141
130	MDB Center of Gravity Resultant Acceleration	B-142
131	MDB Left Rear X-Axis Acceleration	B-143
132	MDB Left Rear X-Axis Velocity	B-144
133	MDB Left Rear Y-Axis Acceleration	B-145
134	MDB Left Rear Y-Axis Velocity	B-146
135	MDB Right Side Contact Switch	B-147
136	MDB Left Side Contact Switch	B-148

Driver and Passenger Dummy Instrumentation Plots

Acceleration Data - FIR Filtered

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
137	Driver Upper Rib Y-Axis Acceleration	B-150
138	Driver Lower Rib Y-Axis Acceleration	B-151
139	Driver Lower Spine Y-Axis Acceleration	B-152
140	Driver Pelvis Y-Axis Acceleration	B-153
141	Left Rear Passenger Upper Rib Y-Axis Acceleration	B-154
142	Left Rear Passenger Lower Rib Y-Axis Acceleration	B-155
143	Left Rear Passenger Lower Spine Y-Axis Acceleration	B-156
144	Left Rear Passenger Pelvis Y-Axis Acceleration	B-157

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Driver and Passenger Dummy Instrumentation Plots
Acceleration Data - FIR Filtered - Redundant

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145	Driver Upper Rib Y-Axis Redundant Acceleration	B-159
146	Driver Lower Rib Y-Axis Redundant Acceleration	B-160
147	Driver Lower Spine Y-Axis Redundant Acceleration	B-161
148	Driver Pelvis Y-Axis Redundant Acceleration	B-162
149	Left Rear Passenger Upper Rib Y-Axis Redundant Acceleration	B-163
150	Left Rear Passenger Lower Rib Y-Axis Redundant Acceleration	B-164
151	Left Rear Passenger Lower Spine Y-Axis Redundant Acceleration	B-165
152	Left Rear Passenger Pelvis Y-Axis Redundant Acceleration	B-166

Driver and Passenger Dummy Instrumentation Plots

Acceleration Data - Filter Class 1000

Integration Data - Filter Class 180

Force Data - Filter Class 1000

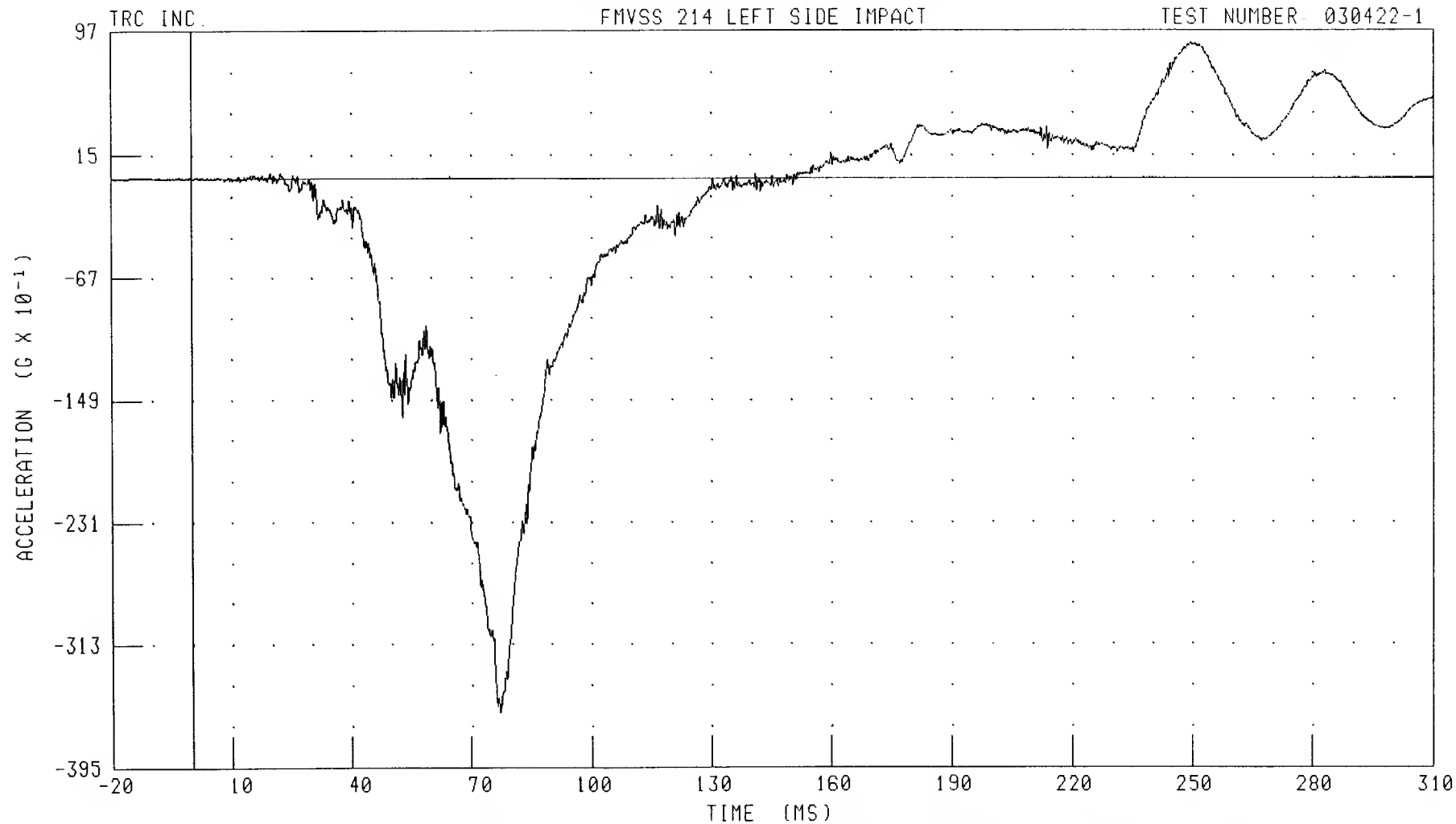
Moment Data - Filter Class 600

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

DRIVER HEAD X-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL: HEDXC1 FILTER: CH CLASS 1000

PEAK DATA 8.88 G @ 249.60 MS, -35.93 G @ 77.04 MS

B-10

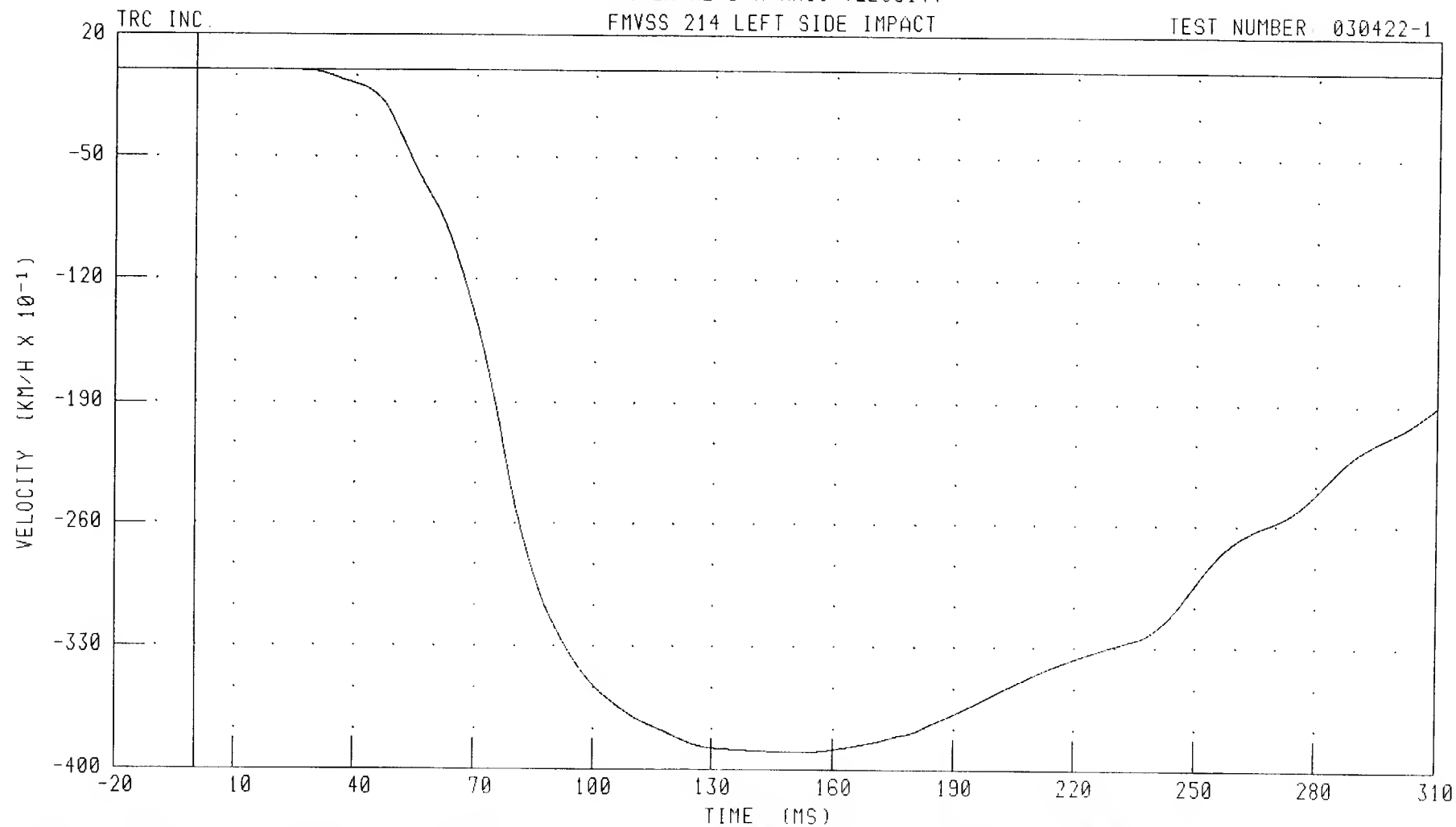
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

DRIVER HEAD X-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: HEDXVI FILTER: CH CLASS 180

PEAK DATA 0 01 KM/H @ 23 04 MS; -39 02 KM/H @ 151 12 MS

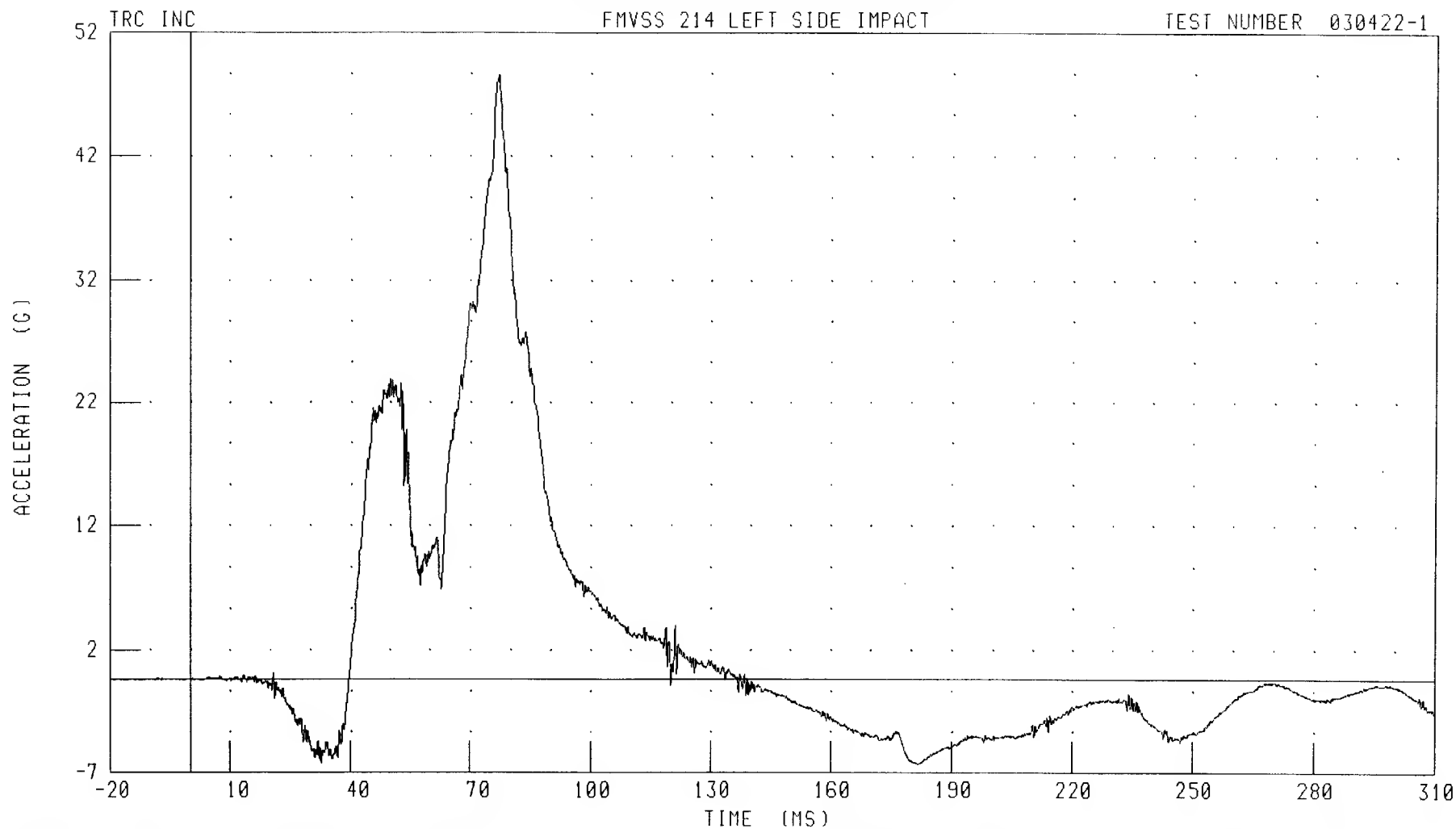
B-11

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
DRIVER HEAD Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



B-12

030422-1

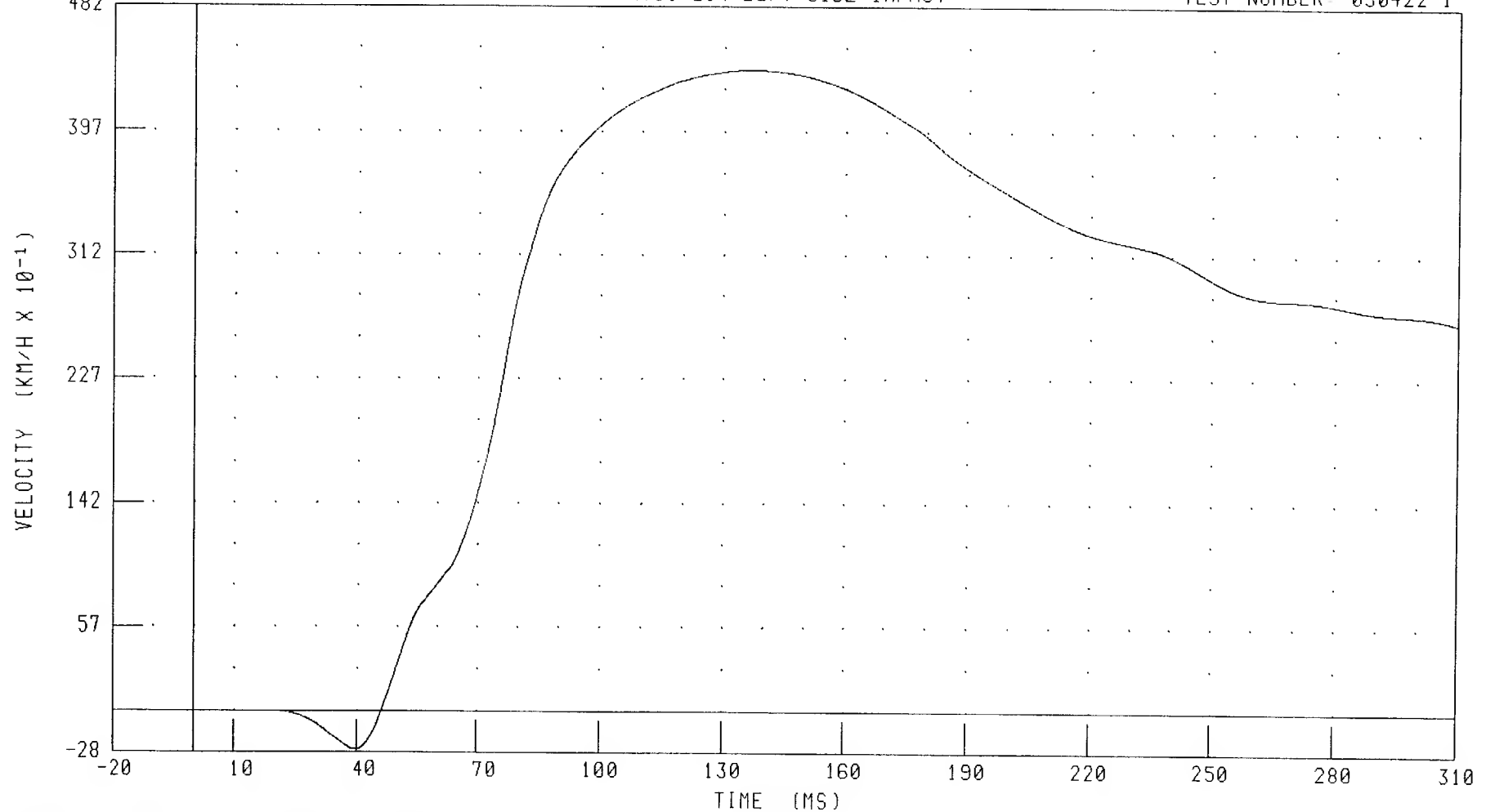
55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

DRIVER HEAD Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER- 030422-1

TRC INC.



CHANNEL: HEDYV1 FILTER: CH CLASS 180

PEAK DATA: 43.84 KM/H @ 136.64 MS; -2.62 KM/H @ 39.60 MS

B-13

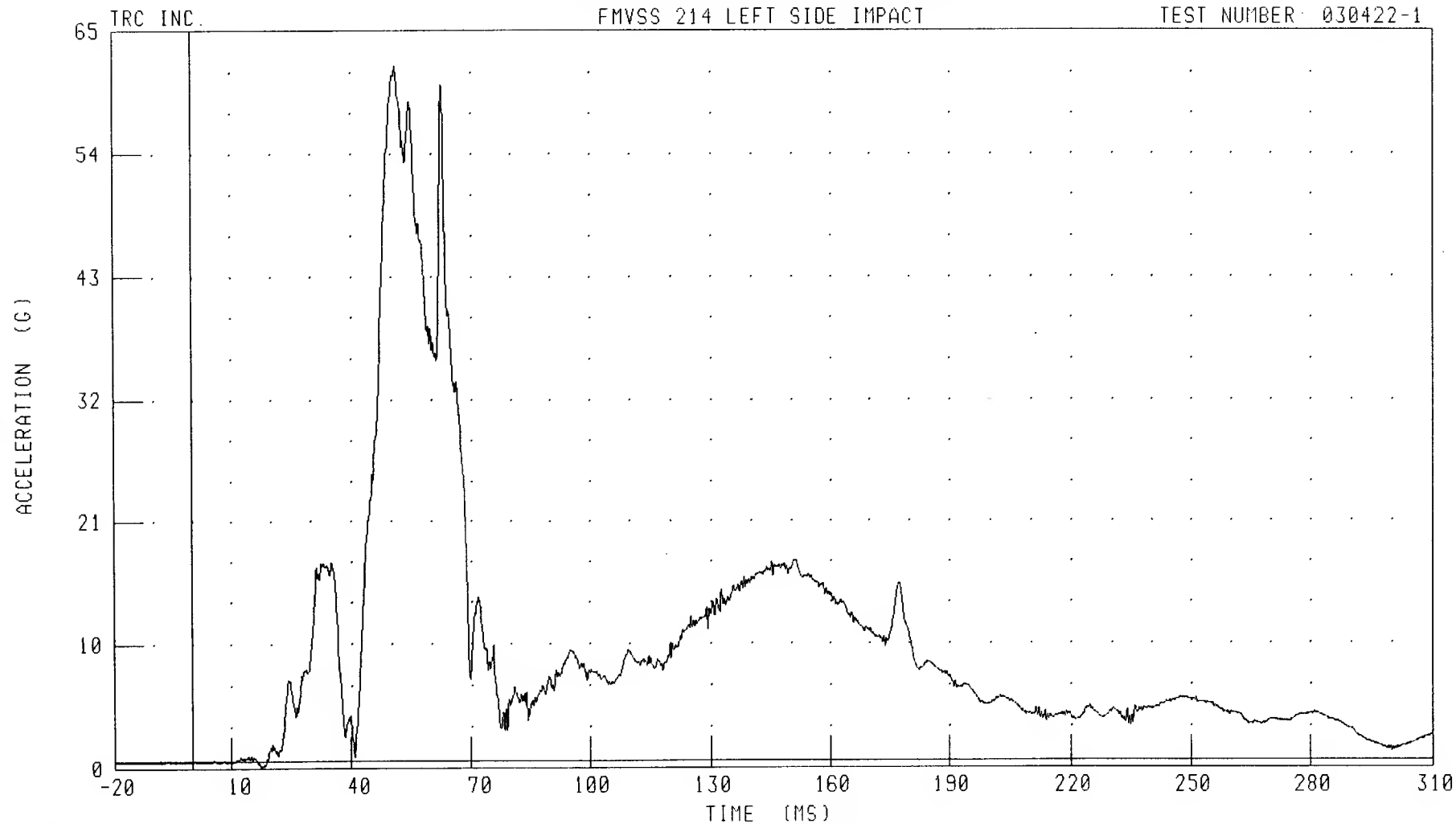
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

DRIVER HEAD Z-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: HEDZG1 FILTER: CH CLASS 1000

B-14

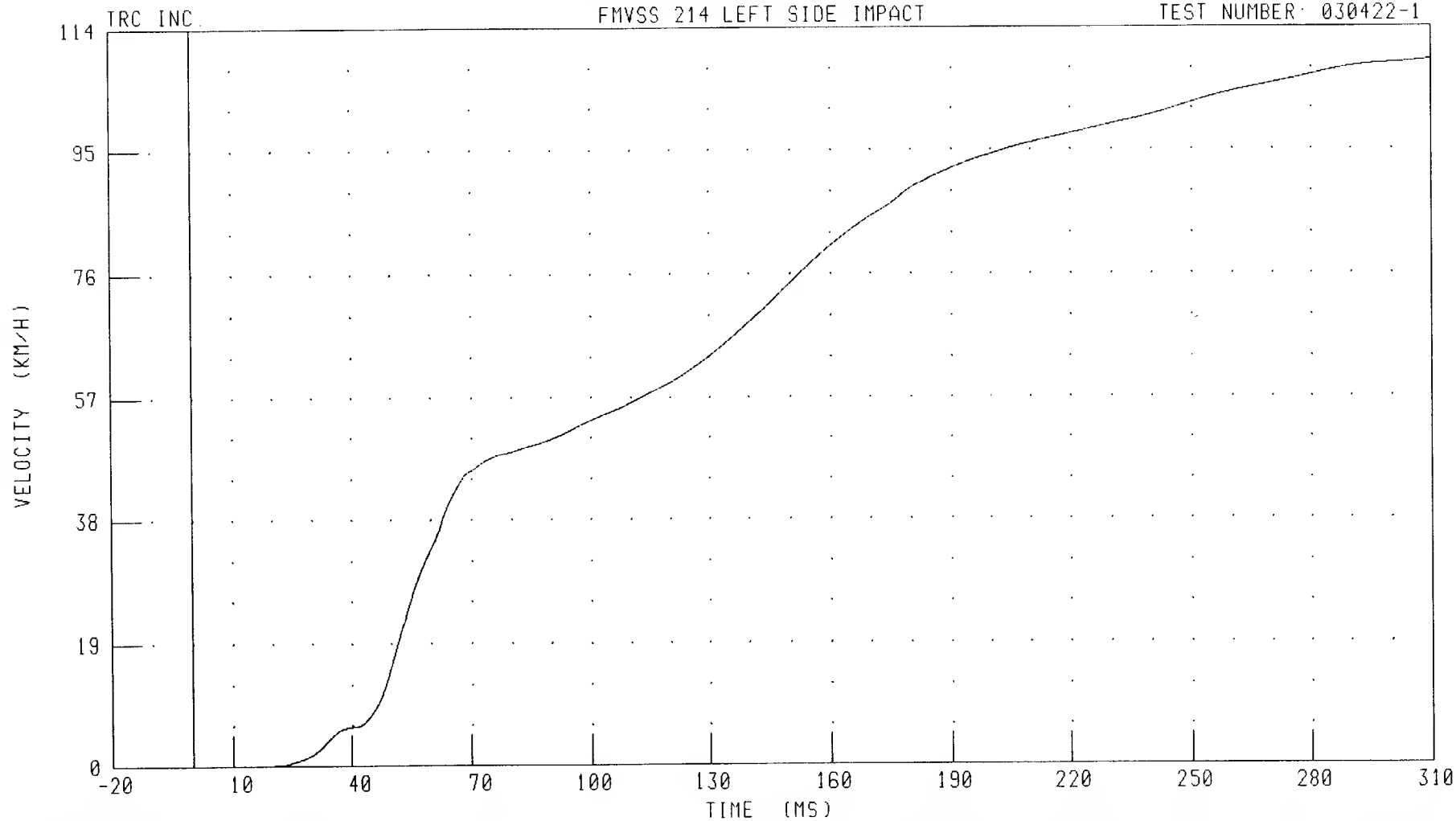
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

DRIVER HEAD Z-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



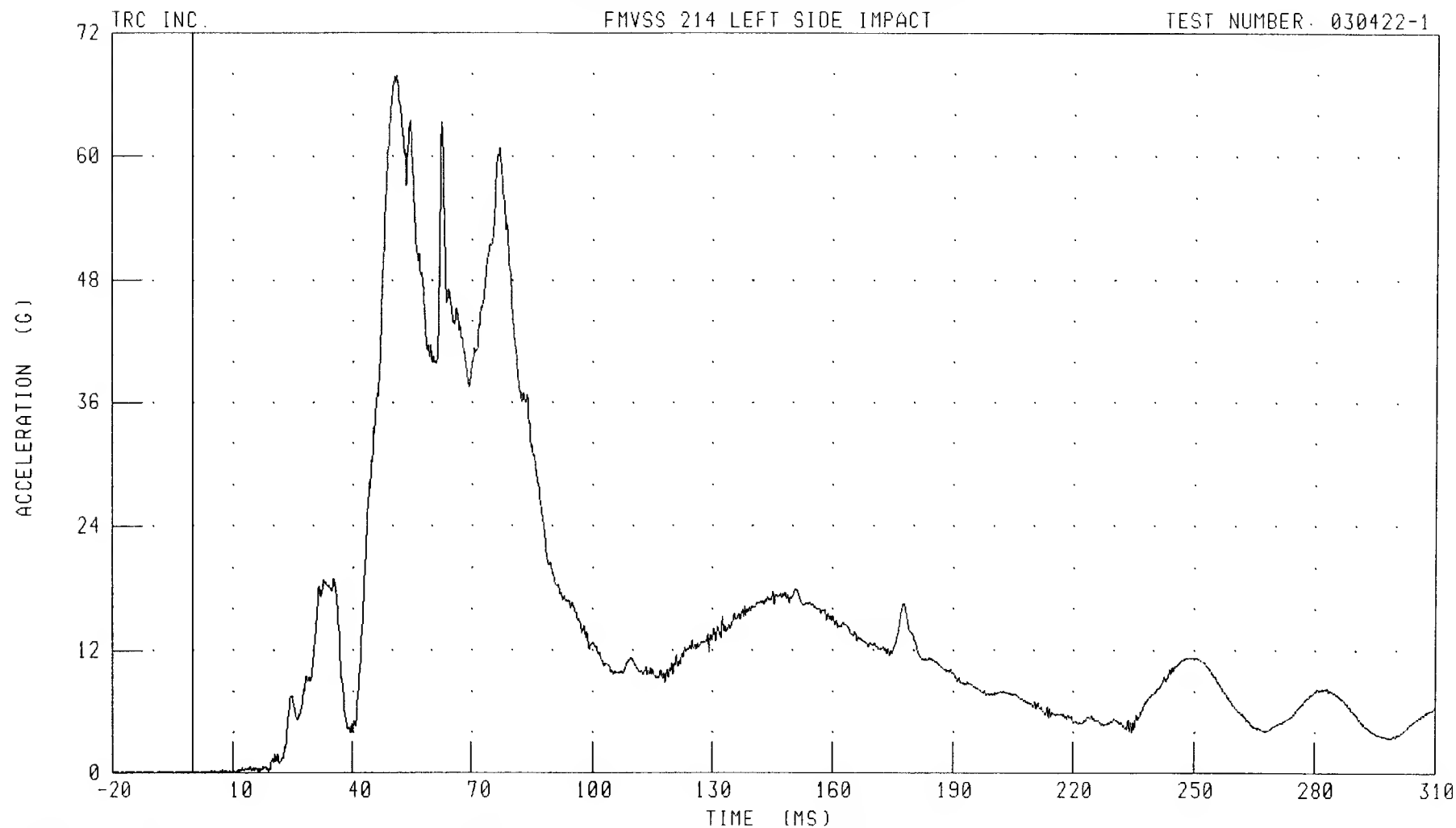
CHANNEL: HEDZV1 FILTER: CH CLASS 180

PEAK DATA: 108.92 KM/H @ 310.00 MS; 0.00 KM/H @ 10.00 MS

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
DRIVER HEAD RESULTANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: HEDRG1 FILTER: CH. CLASS 1000

PEAK DATA: 67.88 G @ 51.04 MS; 0.01 G @ -16.40 MS

B-16

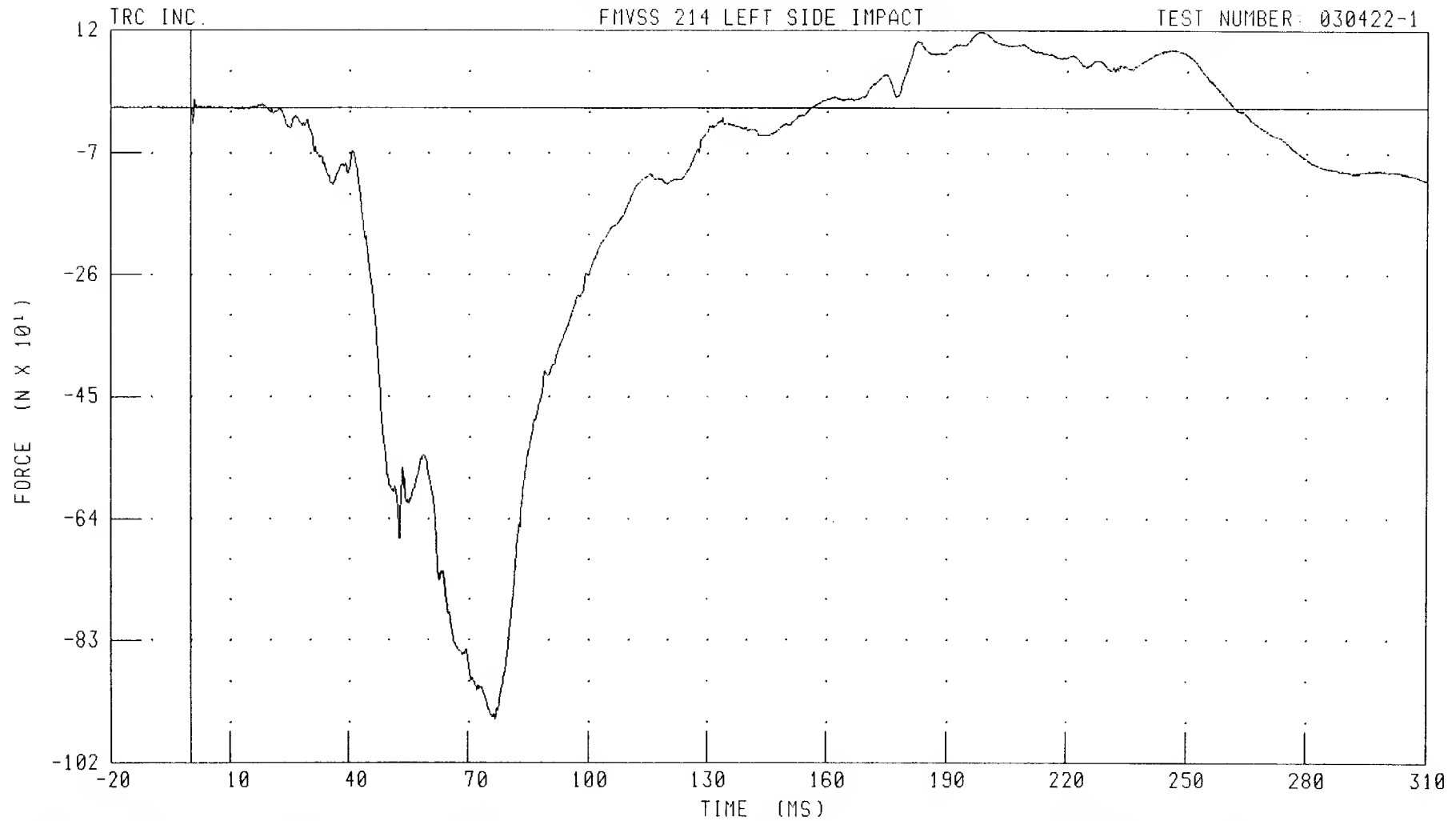
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

DRIVER NECK X-AXIS SHEAR FORCE

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: NEKXF1 FILTER: CH. CLASS 1000

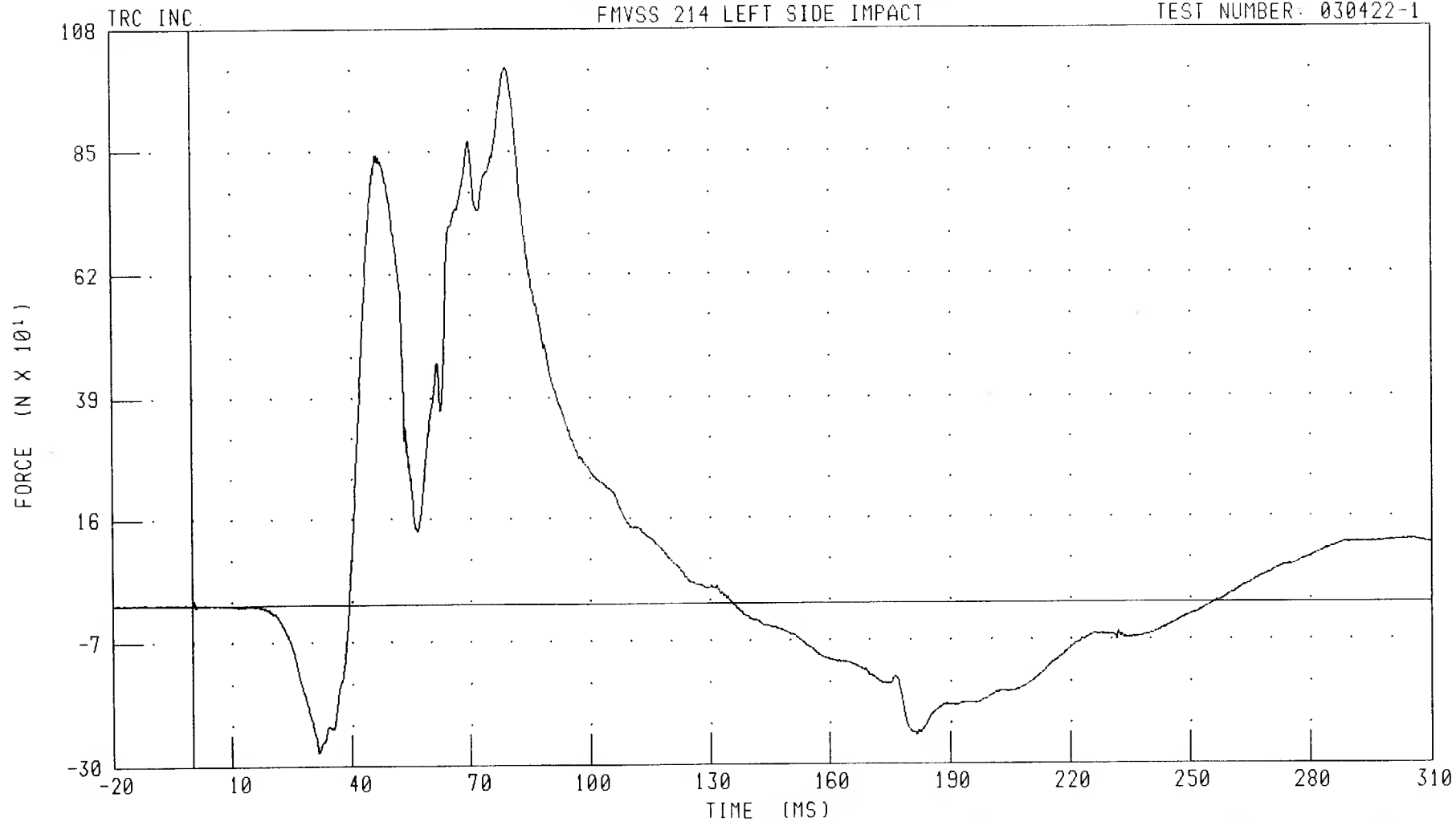
PEAK DATA: 117.57 N @ 198.32 MS, -952.09 N @ 76.72 MS

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

DRIVER NECK Y-AXIS SHEAR FORCE

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: NEKYF1 FILTER: CH. CLASS 1000

PEAK DATA: 1008 68 N @ 79.20 MS; -275 63 N @ 316.8 MS

B-18

030422-1

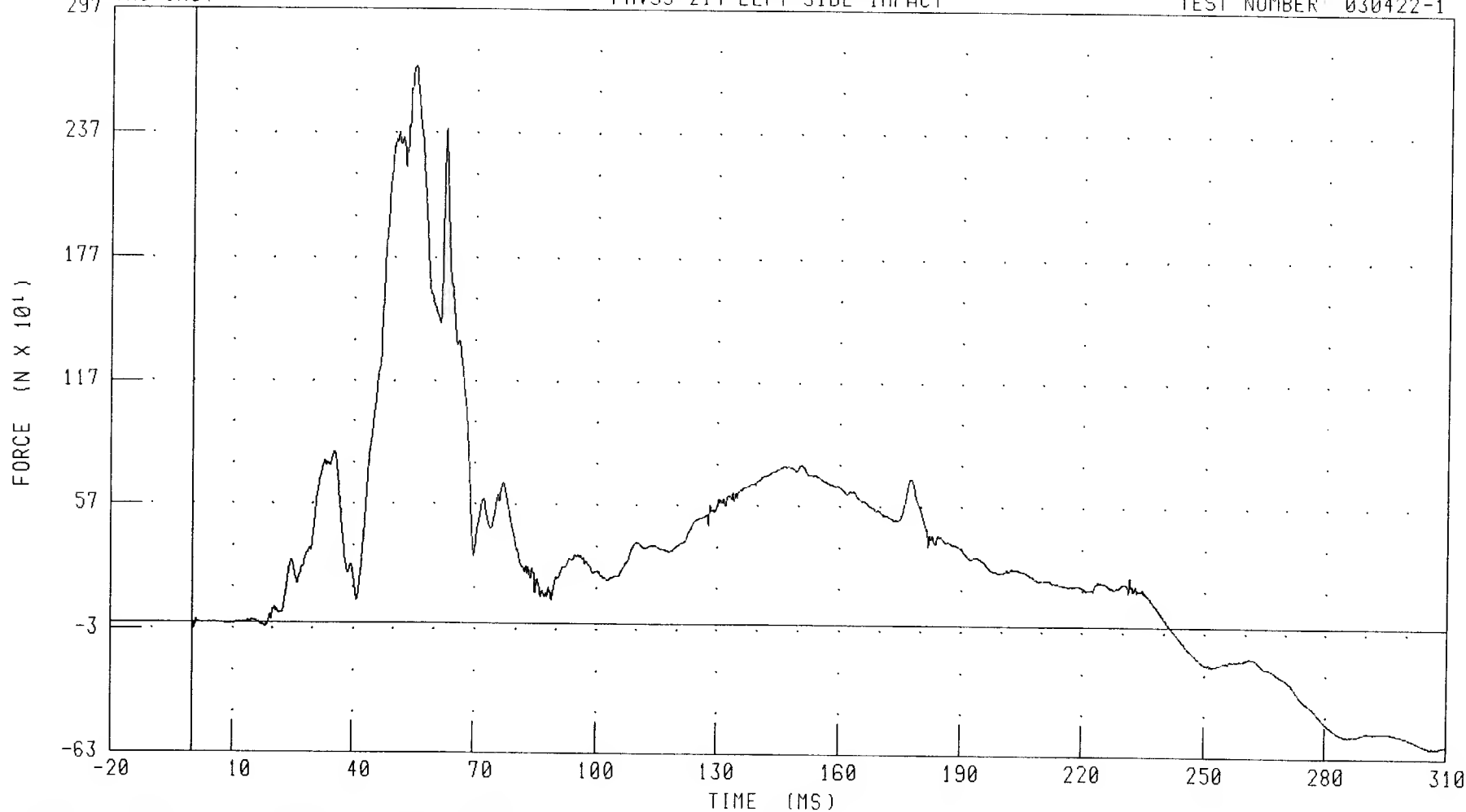
55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

DRIVER NECK Z-AXIS AXIAL FORCE

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1

TRC INC.



CHANNEL: NEKZF1 FILTER: CH CLASS 1000

PEAK DATA: 2693.45 N @ 55.12 MS; -579.98 N @ 307.04 MS

B-19

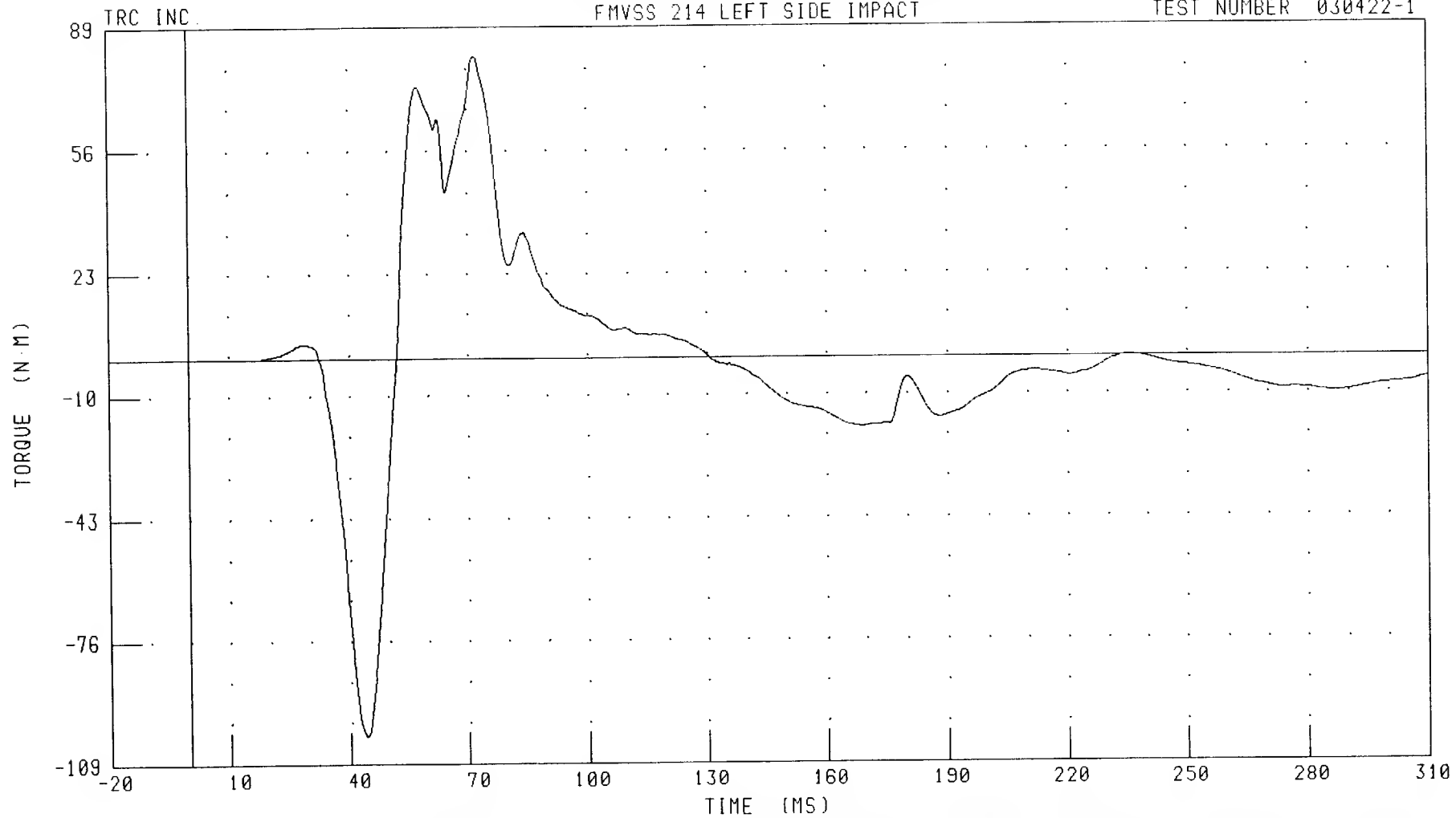
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

DRIVER NECK MOMENT ABOUT X AXIS

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL: NEKXM1 FILTER: CH. CLASS 600

PEAK DATA: 81.18 N·m @ 72.08 ms; -101.66 N·m @ 44.08 ms

B-20

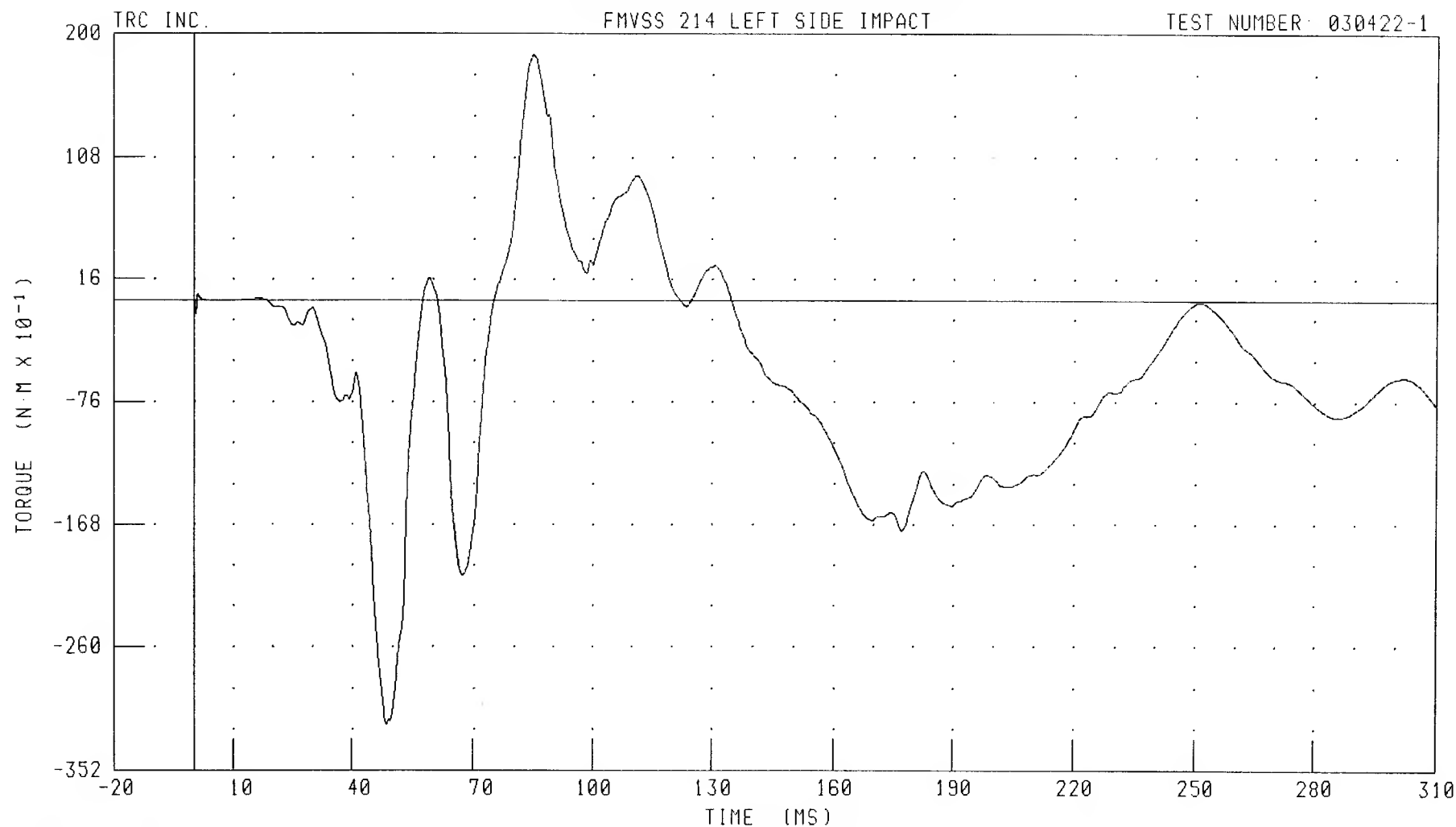
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

DRIVER NECK MOMENT ABOUT Y AXIS

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: NEKYM1 FILTER: CH. CLASS 600

B-21

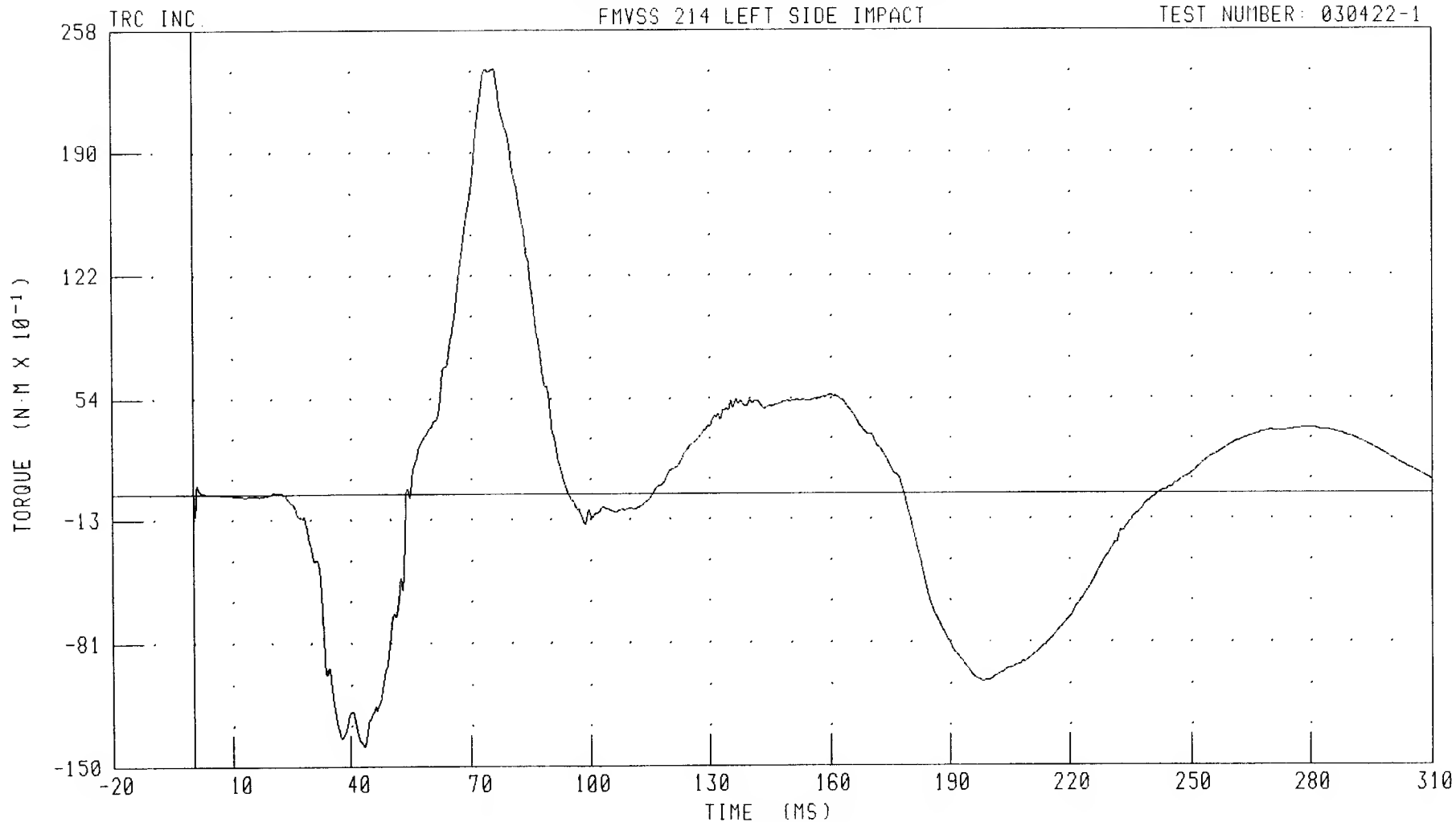
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

DRIVER NECK MOMENT ABOUT Z AXIS

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: NEKZM1 FILTER: CH CLASS 600

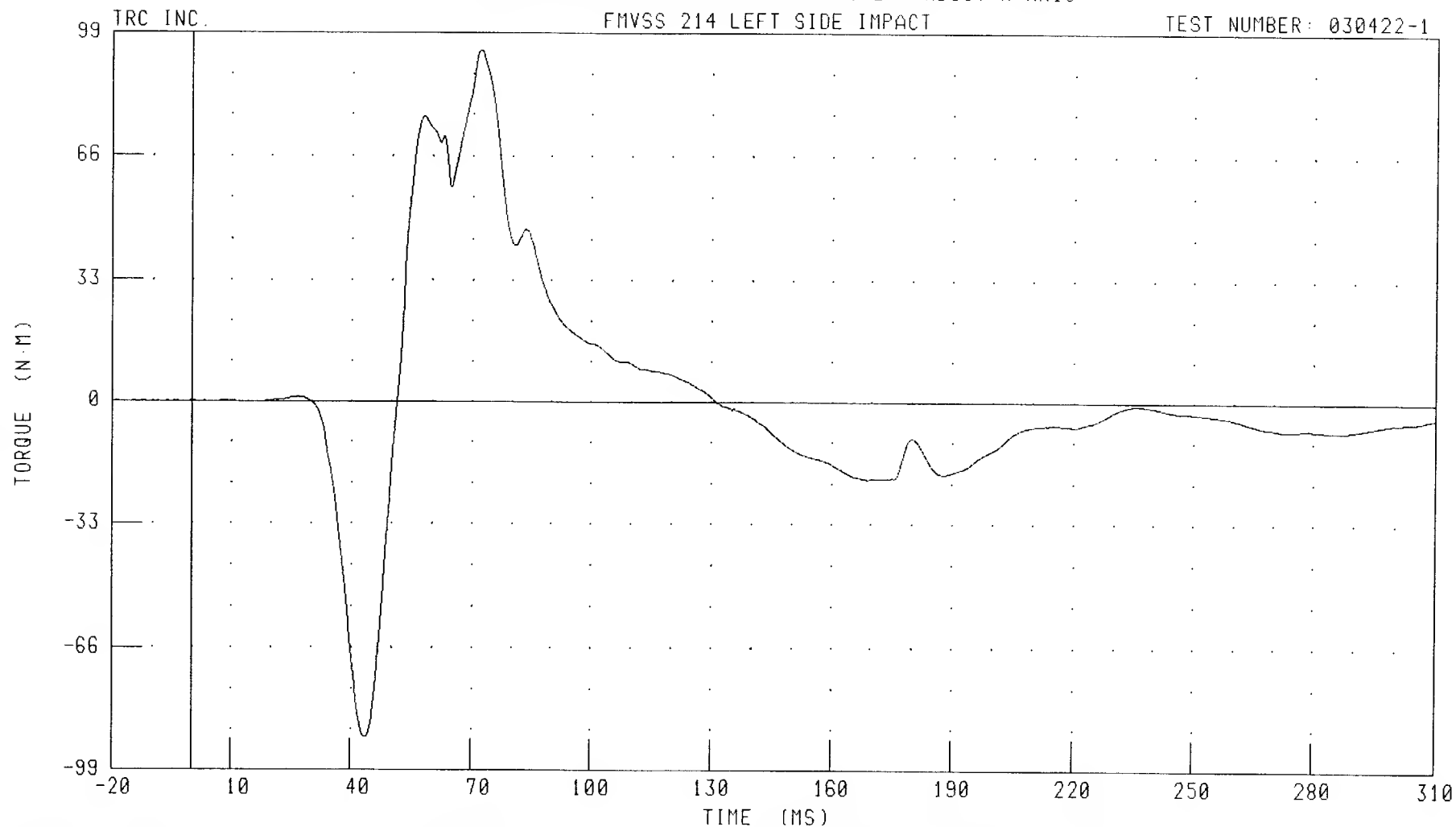
B-22

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
DRIVER NECK OCCIPITAL CONDYLE MOMENT ABOUT X AXIS

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: NK0XM1 FILTER: CH CLASS 600

PEAK DATA: 94.33 N·m @ 72.00 MS; -90.16 N·m @ 43.44 MS

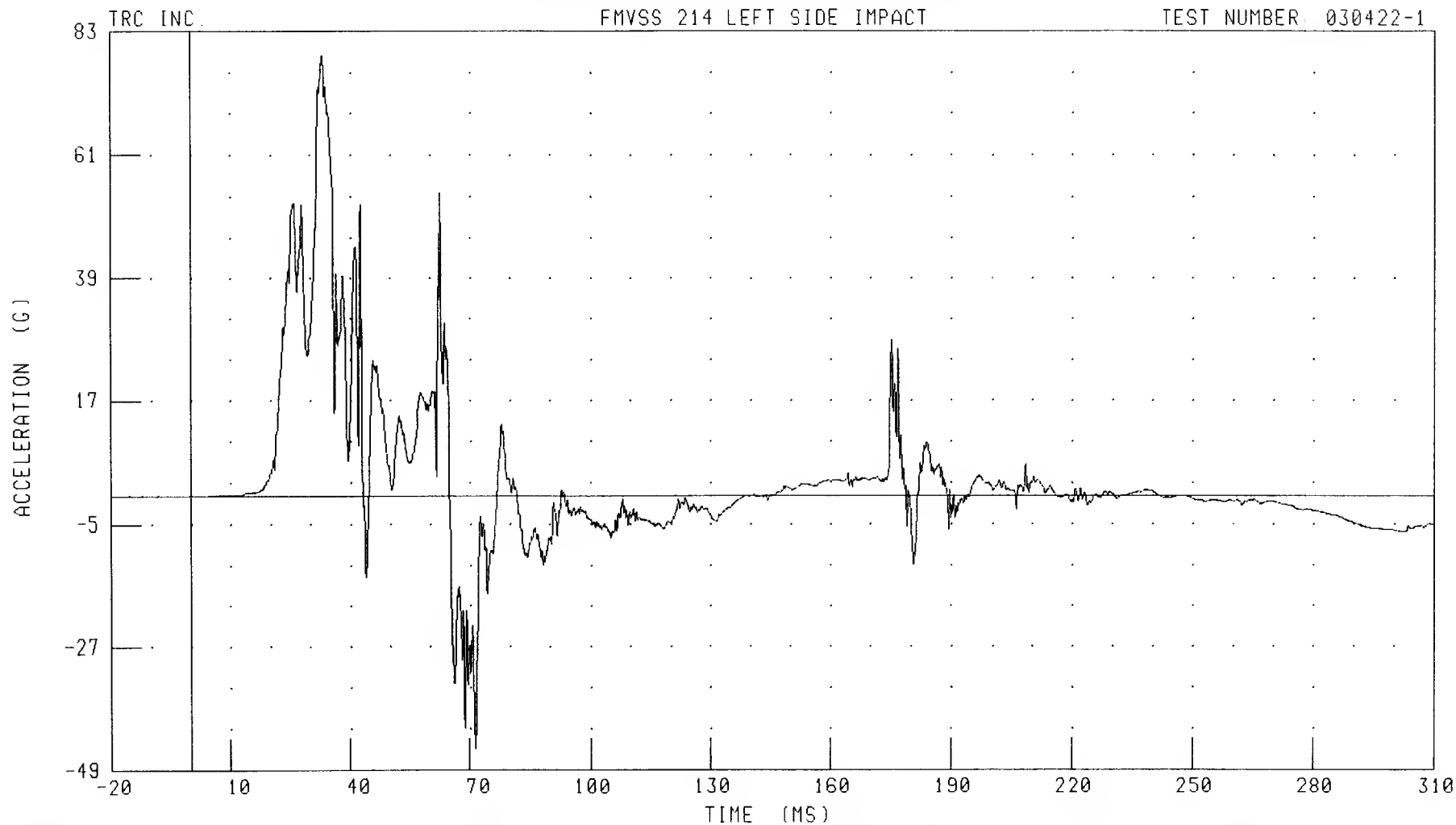
B-23

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
DRIVER UPPER RIB Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL LURYG1 FILTER CH CLASS 1000

PEAK DATA: 78.79 G @ 33.20 MS; -45.30 G @ 71.44 MS

B-24

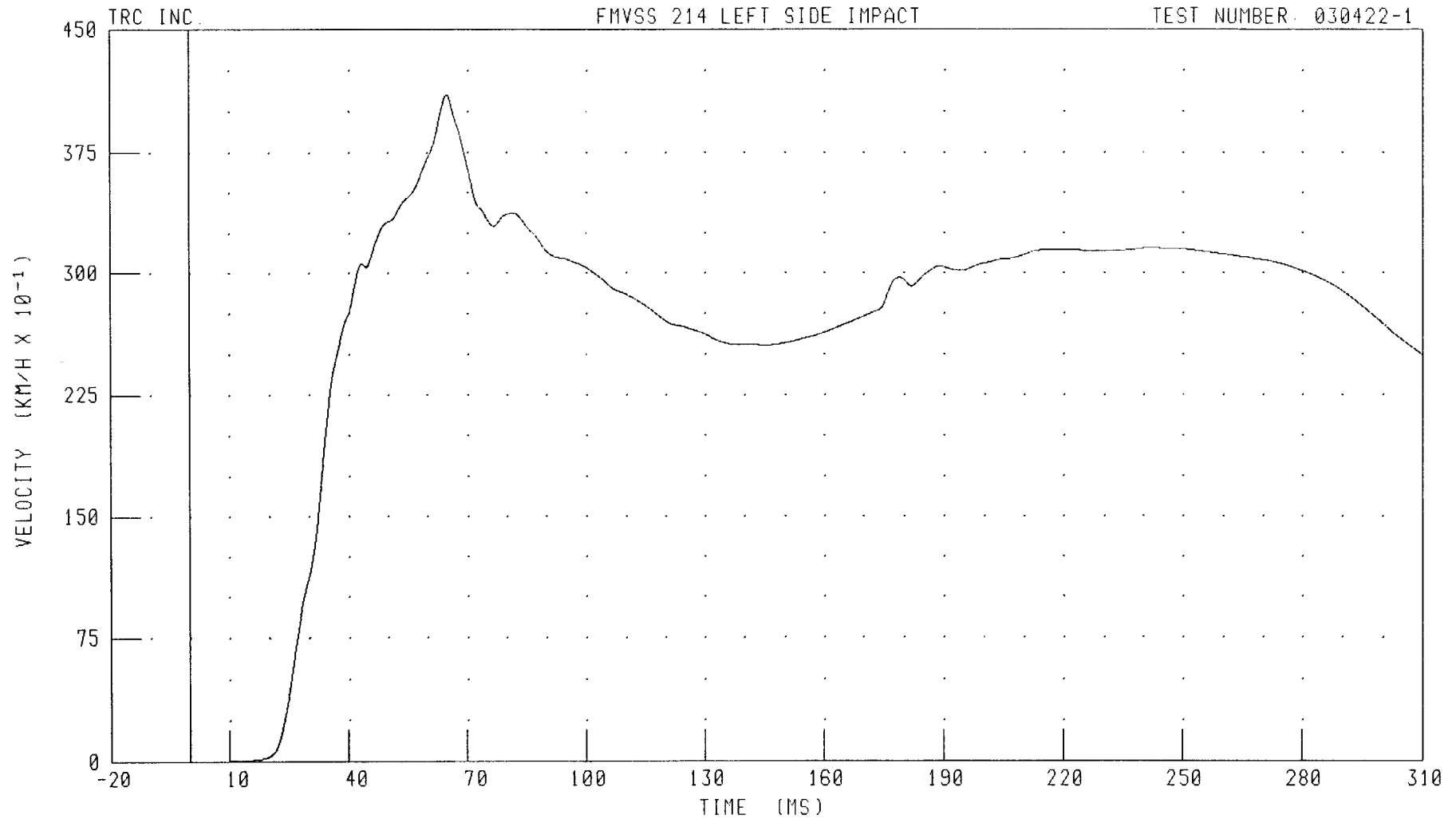
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

DRIVER UPPER RIB Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: LURYV1 FILTER: CH. CLASS 180

PEAK DATA: 41 04 KM/H @ 64 96 MS; 0 00 KM/H @ 0 00 MS

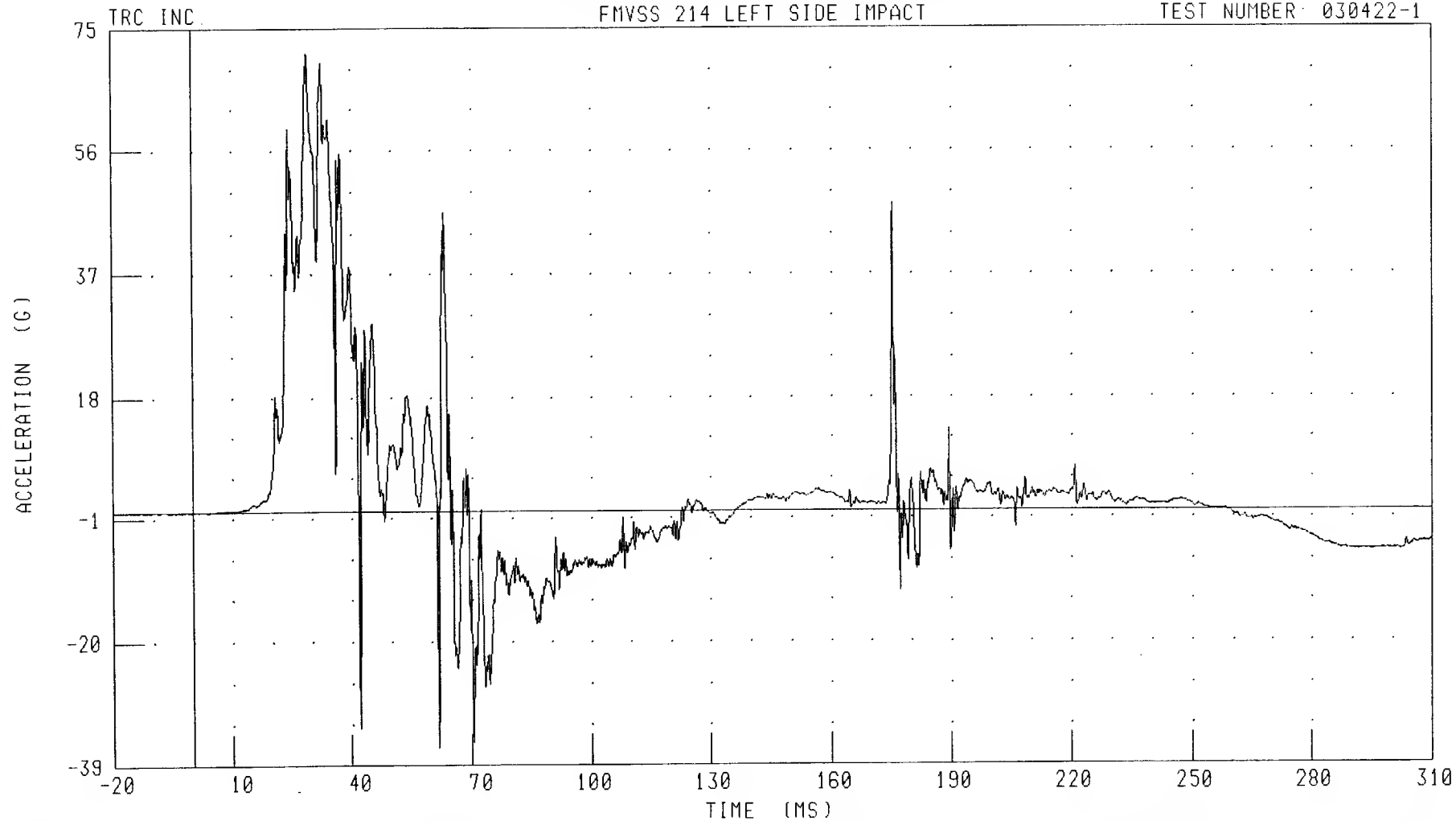
B-25

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
DRIVER LOWER RIB Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: LLRYG1 FILTER: CH CLASS 1000

B-26

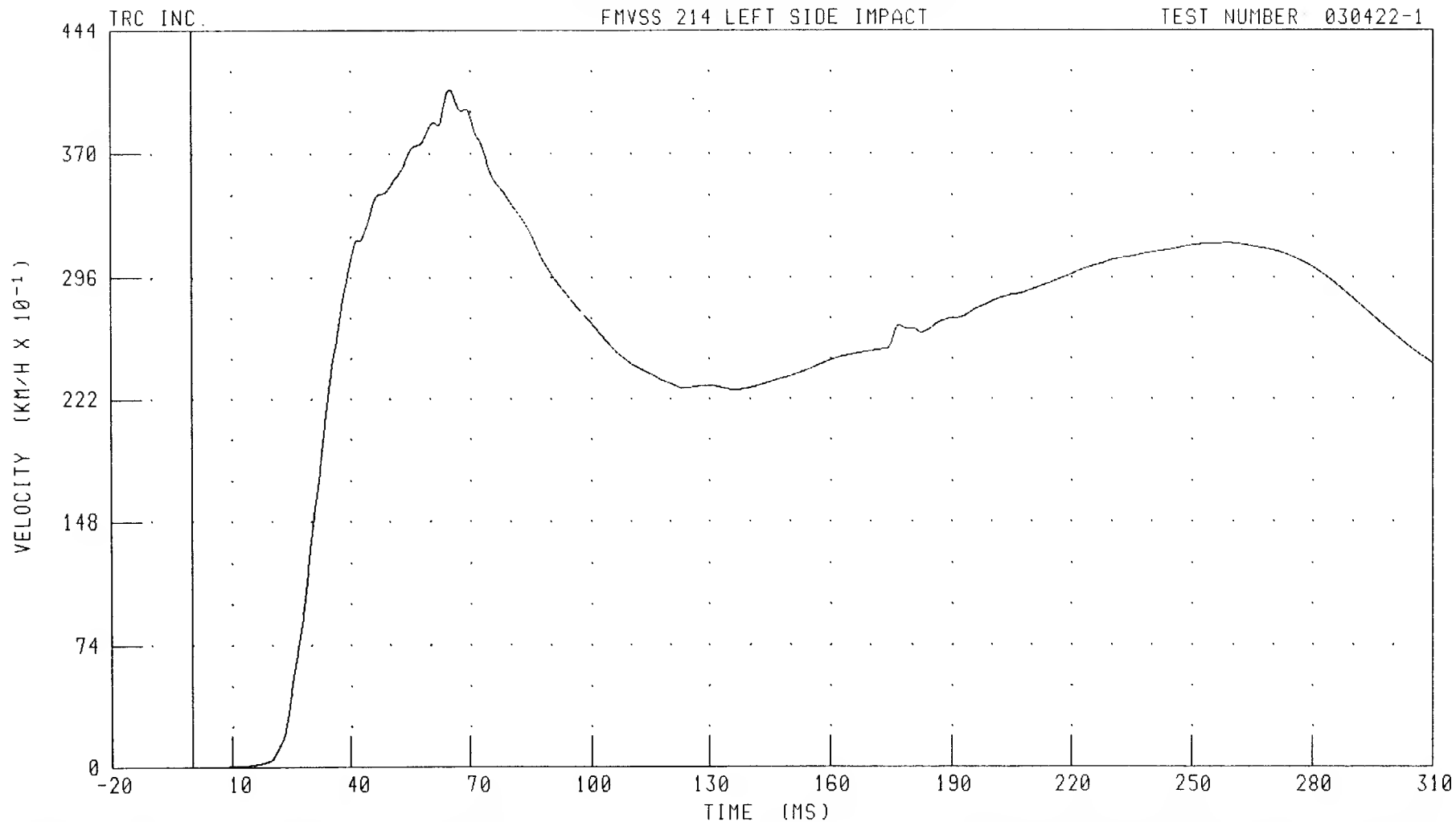
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

DRIVER LOWER RIB Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL: LLRYV1 FILTER: CH CLASS 180

PEAK DATA 40 77 KM/H @ 64 96 MS, 0 00 KM/H @ 0 00 MS

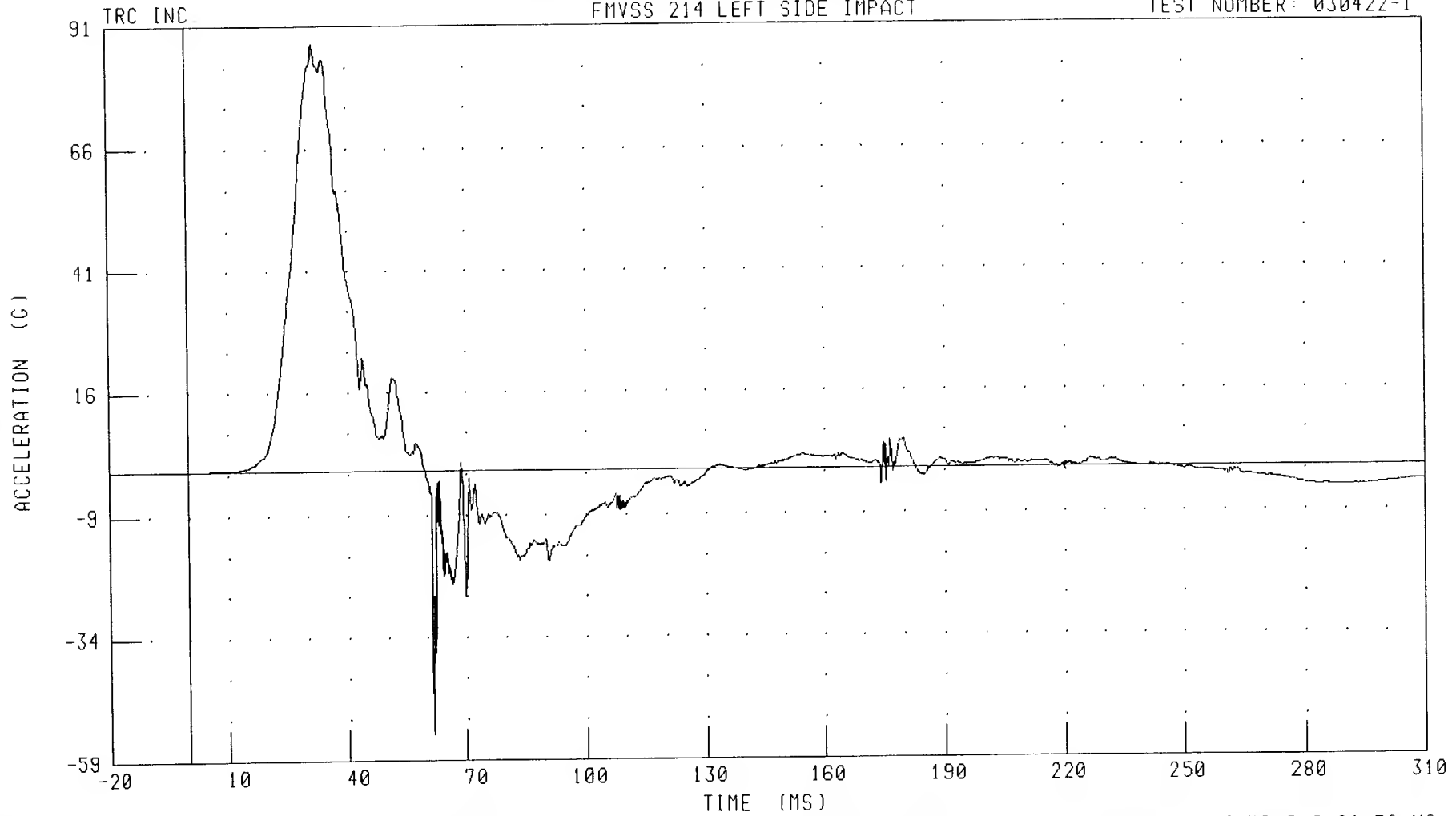
B-27

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
DRIVER LOWER SPINE Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: T12YG1 FILTER: CH. CLASS 1000

PEAK DATA 87.45 G @ 31.76 MS; -53.79 G @ 61.52 MS

B-28

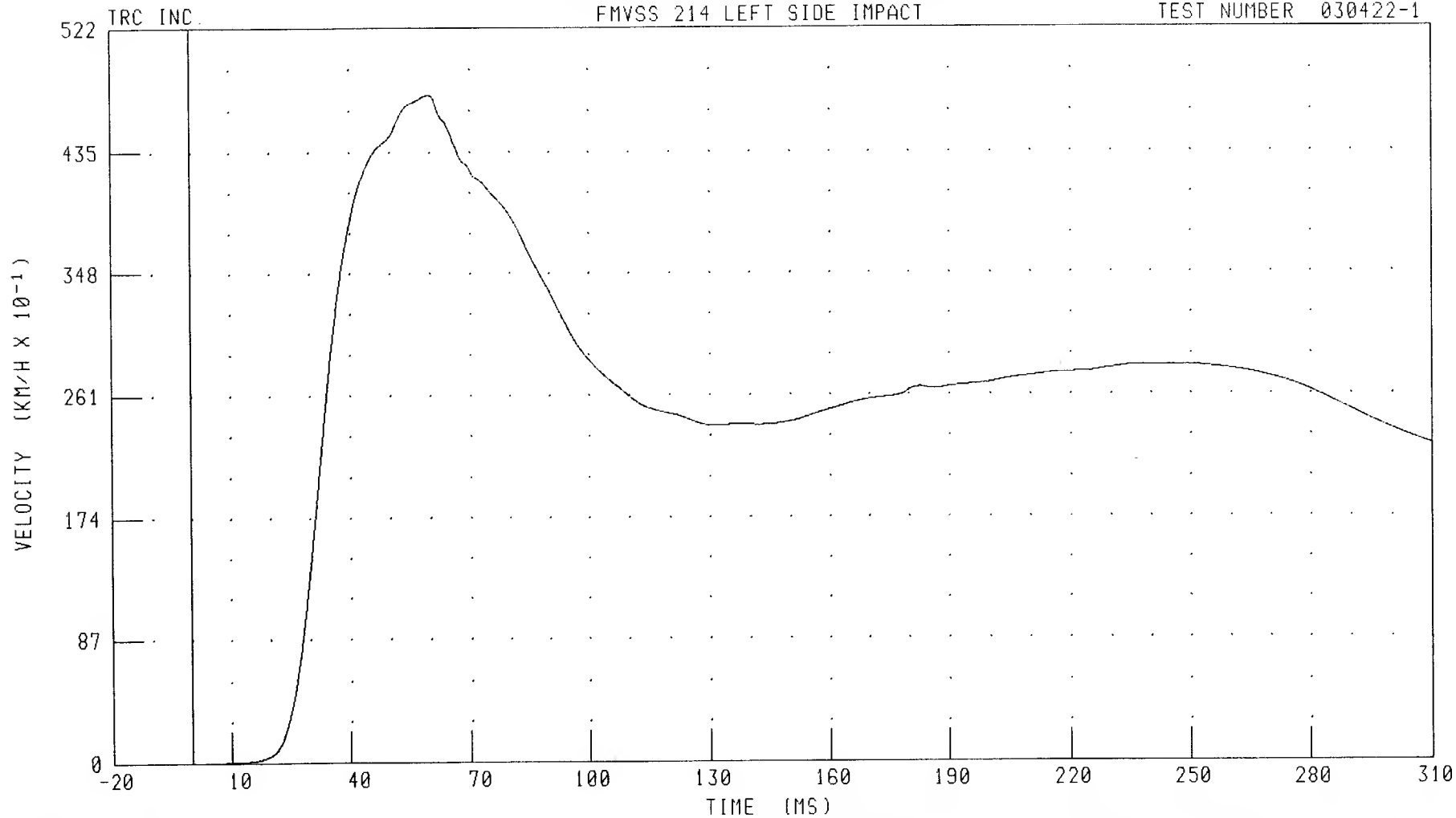
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

DRIVER LOWER SPINE Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL: T12YV1 FILTER: CH CLASS 180

PEAK DATA: 47.48 KM/H @ 59.76 MS; 0.00 KM/H @ 0.00 MS

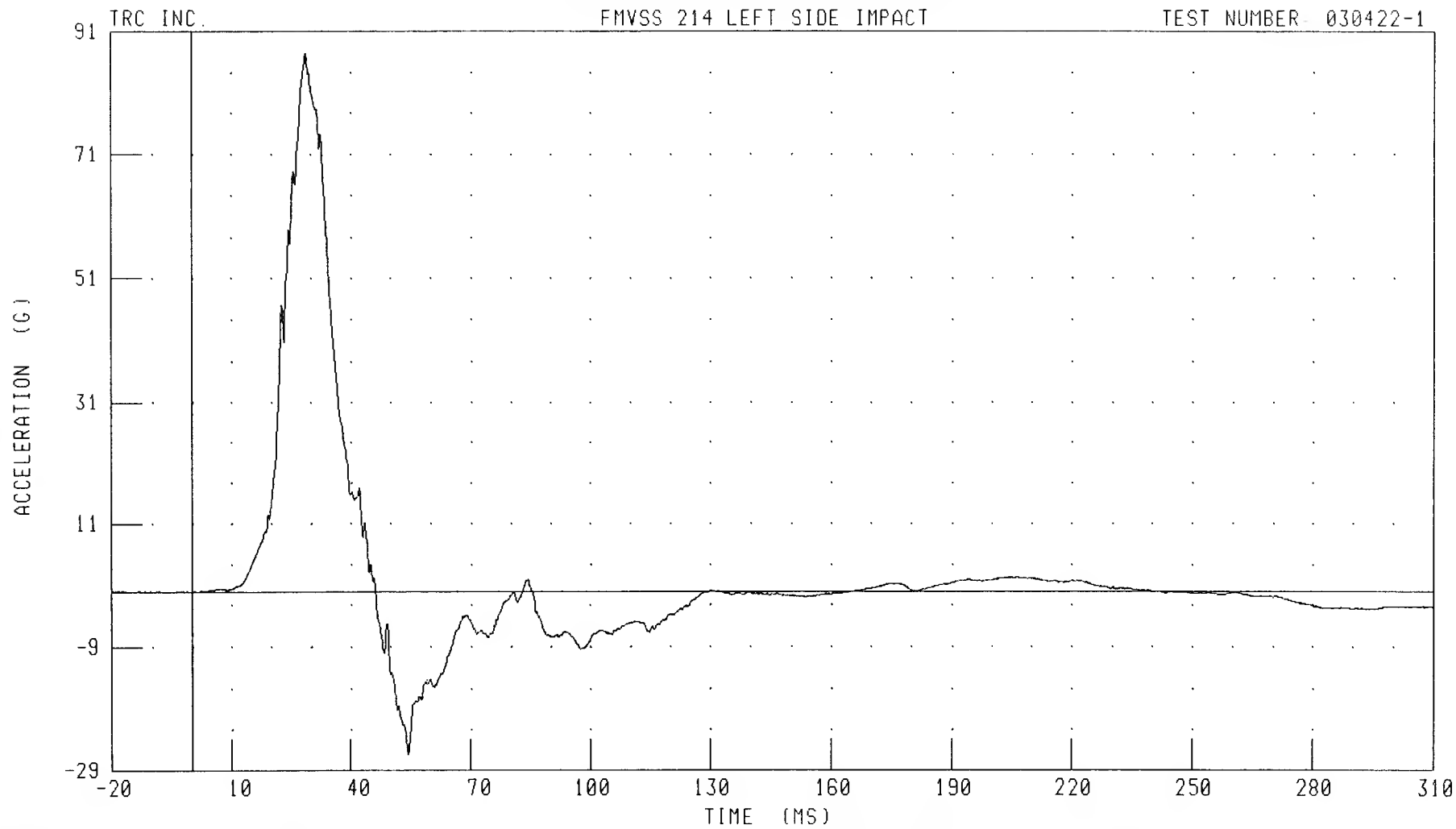
B-29

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
DRIVER PELVIS Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL: PEVYG1 FILTER: CH CLASS 1000

PEAK DATA 87.44 G @ 28.72 MS, -26.40 G @ 54.40 MS

B-30

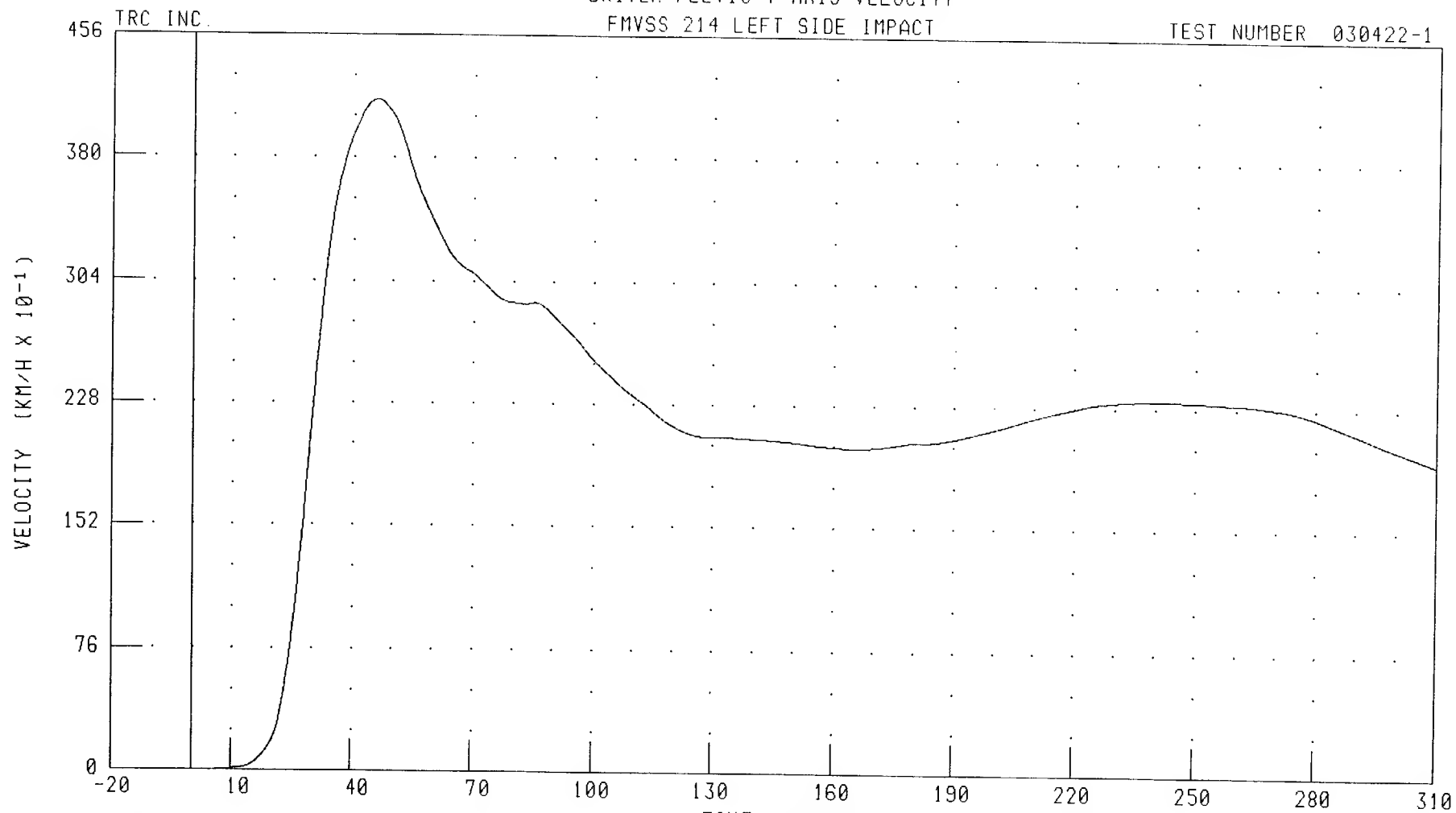
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

DRIVER PELVIS Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL: PEVYV1

FILTER: CH. CLASS 180

PEAK DATA: 41 55 KM/H @ 46 16 MS; 0 00 KM/H @ 0 00 MS

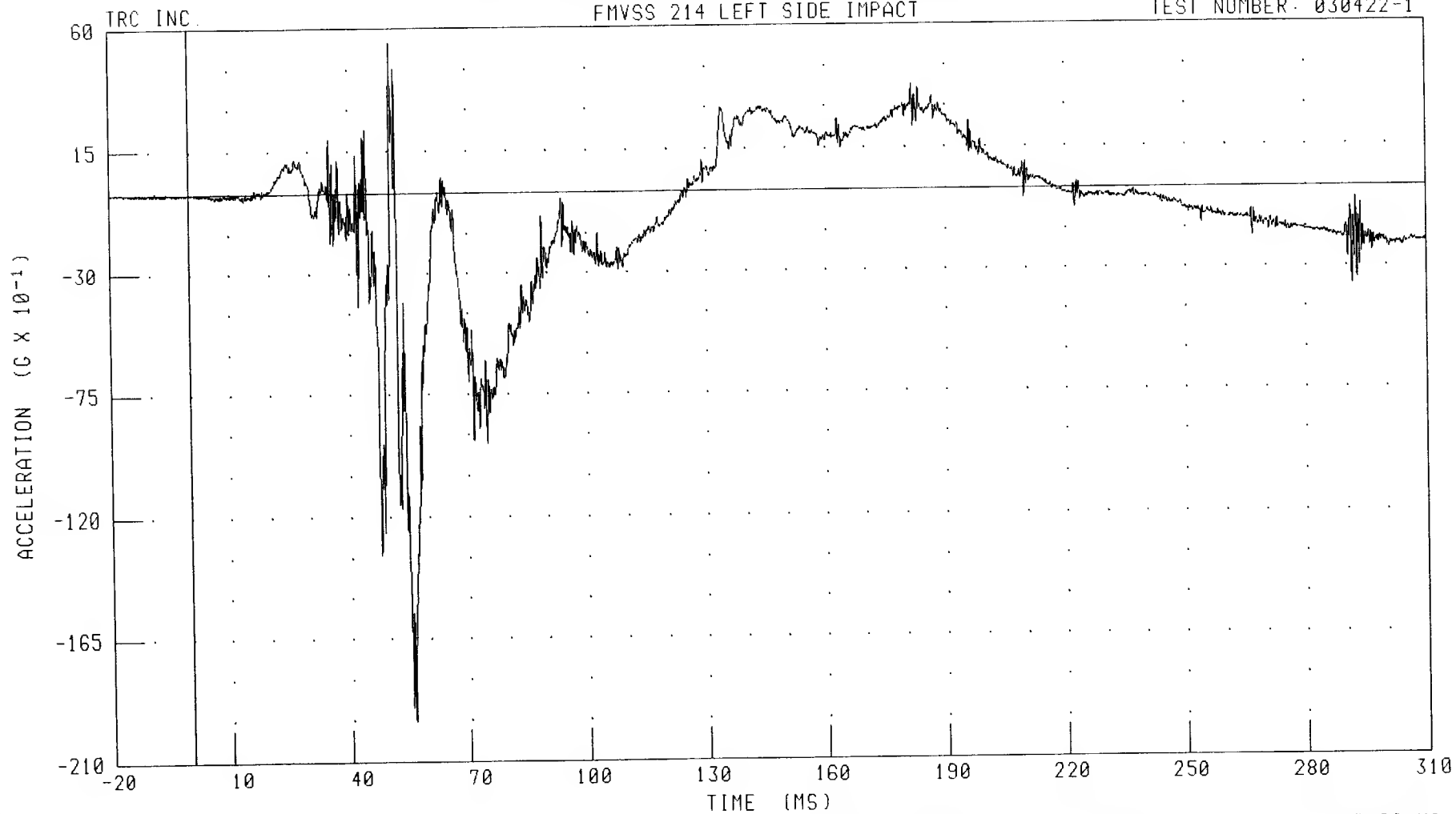
B-31

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT REAR PASSENGER HEAD X-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: HEDXC4 FILTER: CH. CLASS 1000

B-32

030422-1

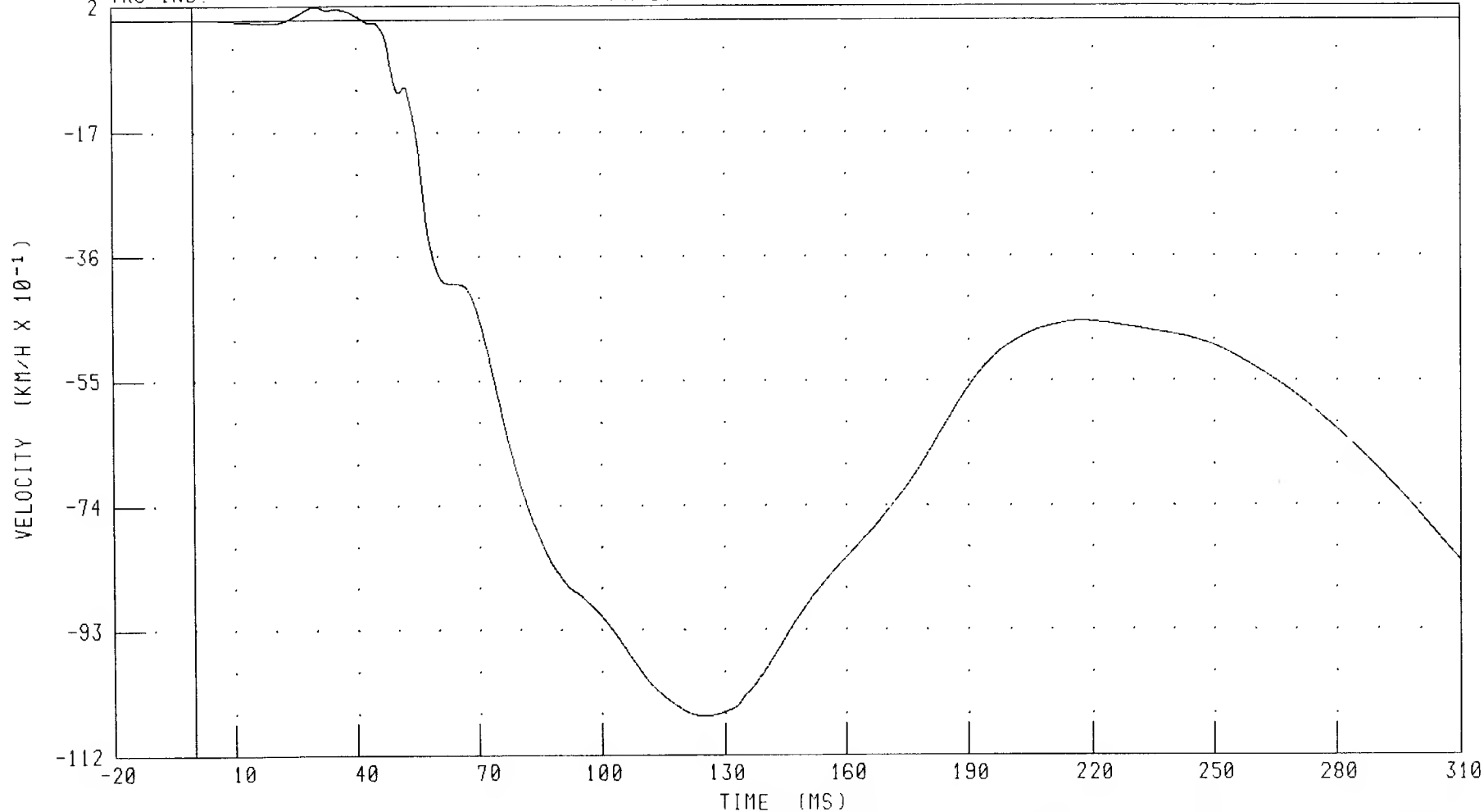
55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

LEFT REAR PASSENGER HEAD X-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1

2 TRC INC.



CHANNEL: HEDXV4 FILTER: CH CLASS 180

PEAK DATA: 0.19 KM/H @ 30.16 MS; -10.61 KM/H @ 125.04 MS

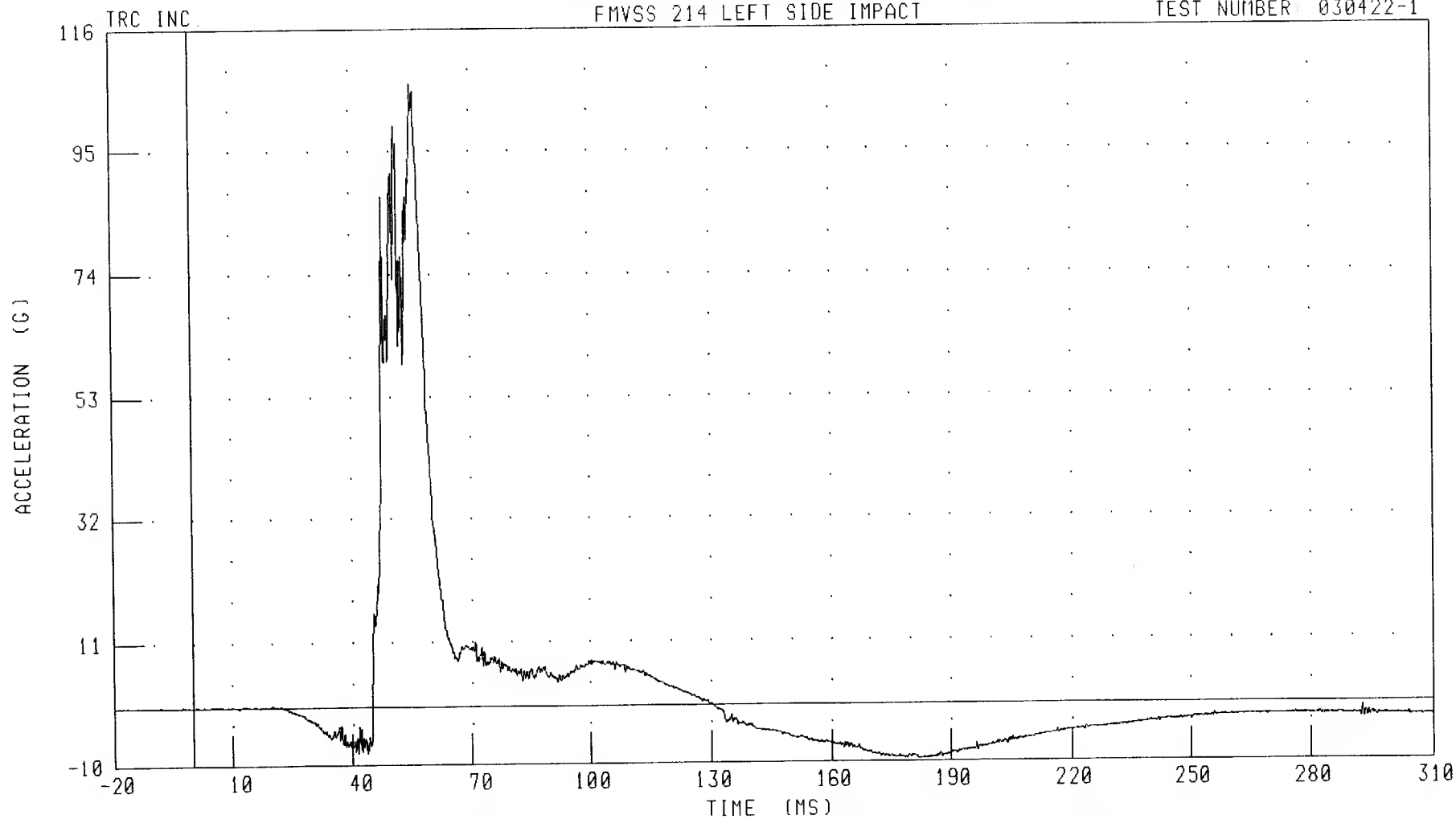
B-33

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT REAR PASSENGER HEAD Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: HEDYG4 FILTER: CH CLASS 1000

PEAK DATA: 106.67 G @ 55.44 MS; -9.54 G @ 183.12 MS

B-34

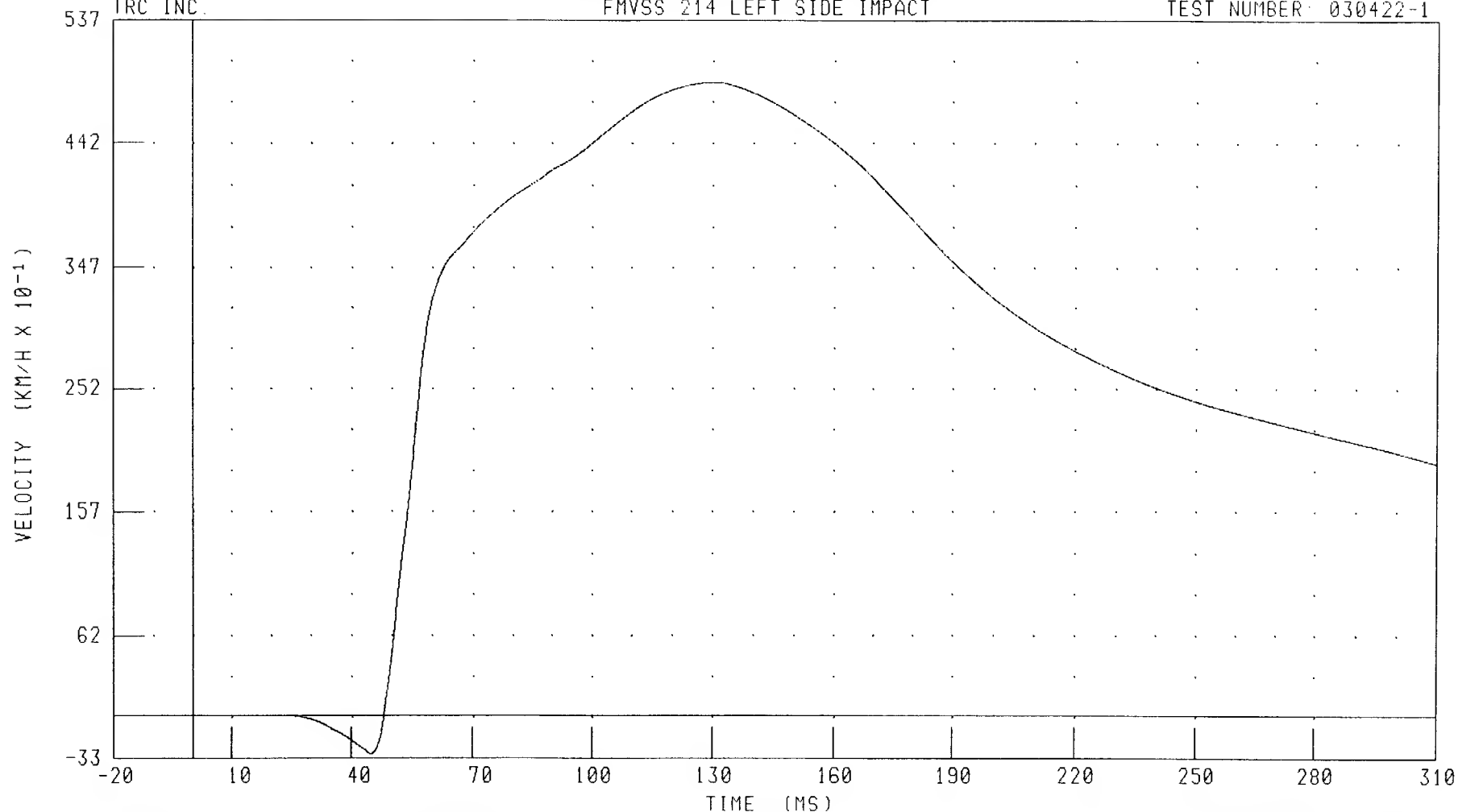
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT REAR PASSENGER HEAD Y-AXIS VELOCITY

TRC INC.

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: HEDYV4 FILTER: CH CLASS 180

PEAK DATA: 48.91 KM/H @ 130.16 MS; -3.00 KM/H @ 44.88 MS

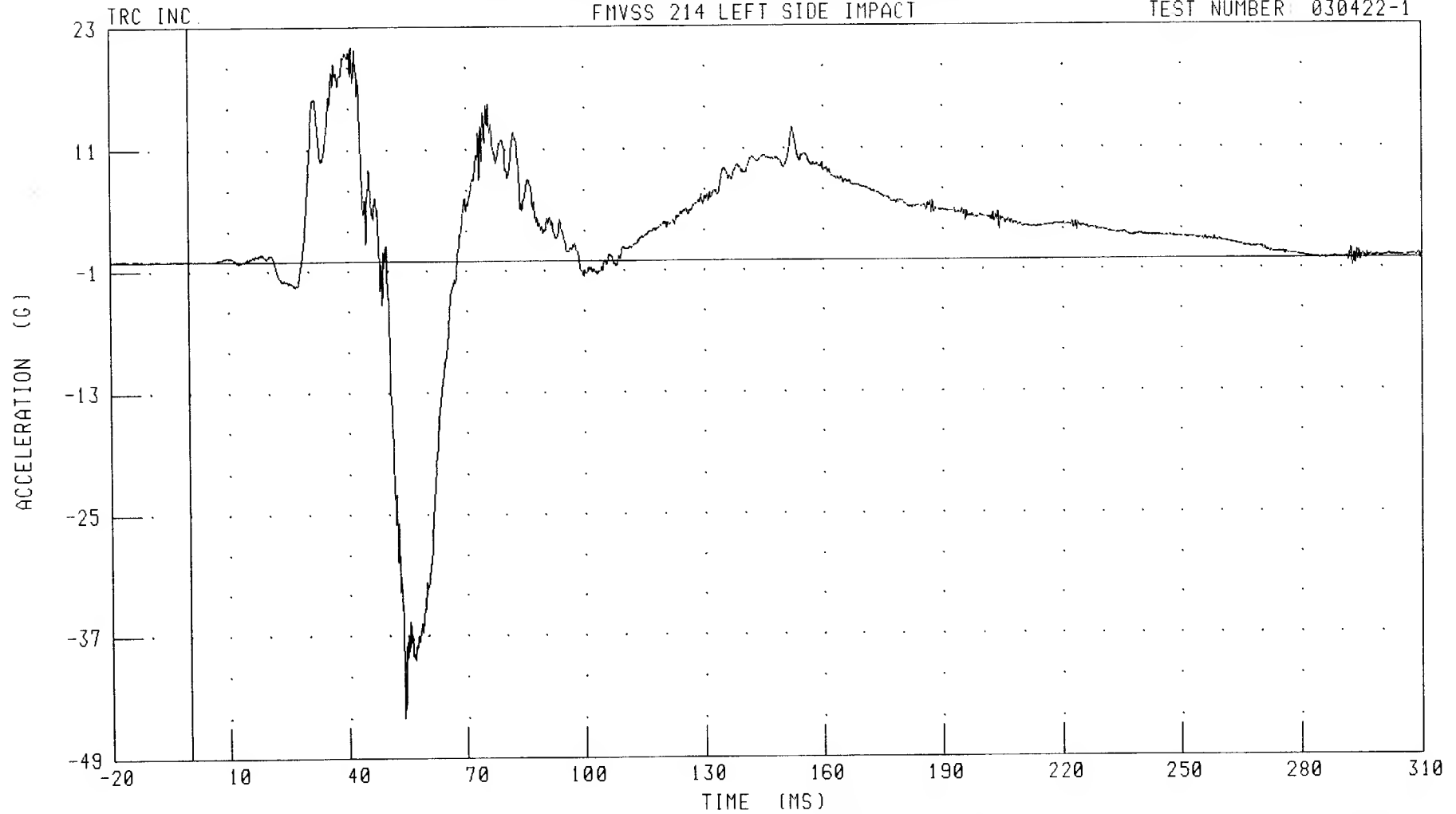
B-35

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT REAR PASSENGER HEAD Z-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



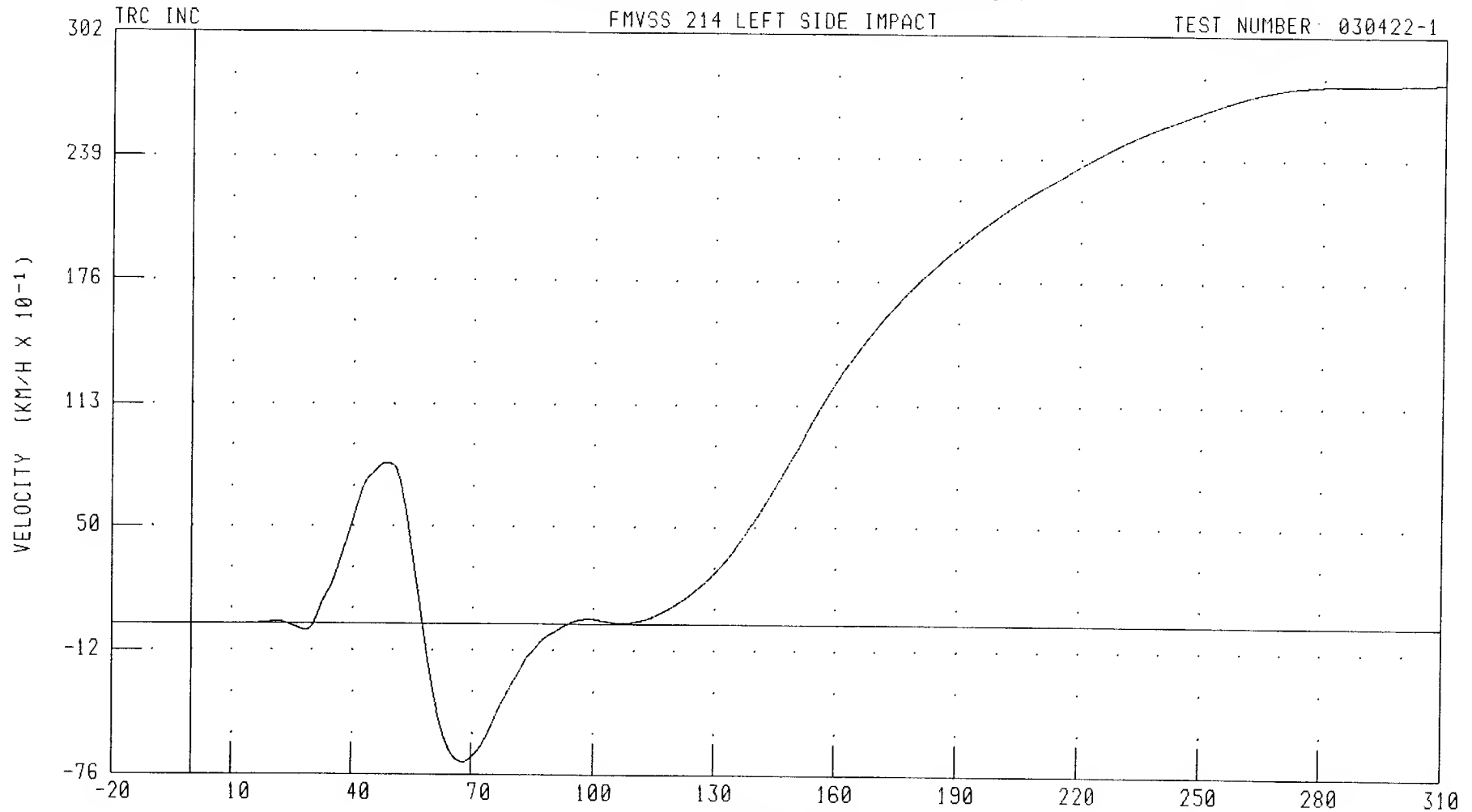
B-36

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT REAR PASSENGER HEAD Z-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL HEDZV4 FILTER CH. CLASS 180

PEAK DATA 27 86 KM/H @ 310 00 MS, -6 97 KM/H @ 67 84 MS

B-37

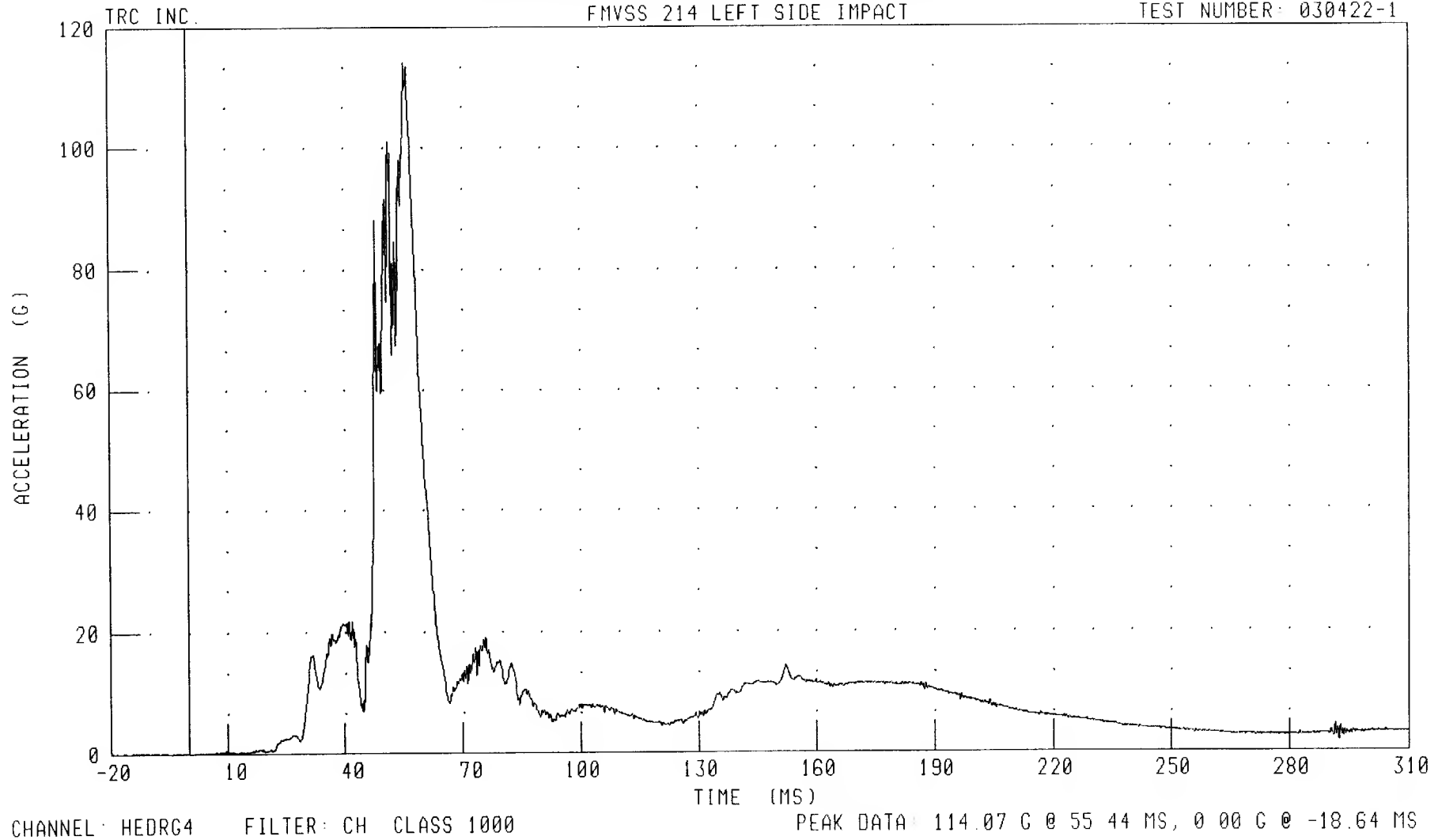
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

LEFT REAR PASSENGER HEAD RESULTANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



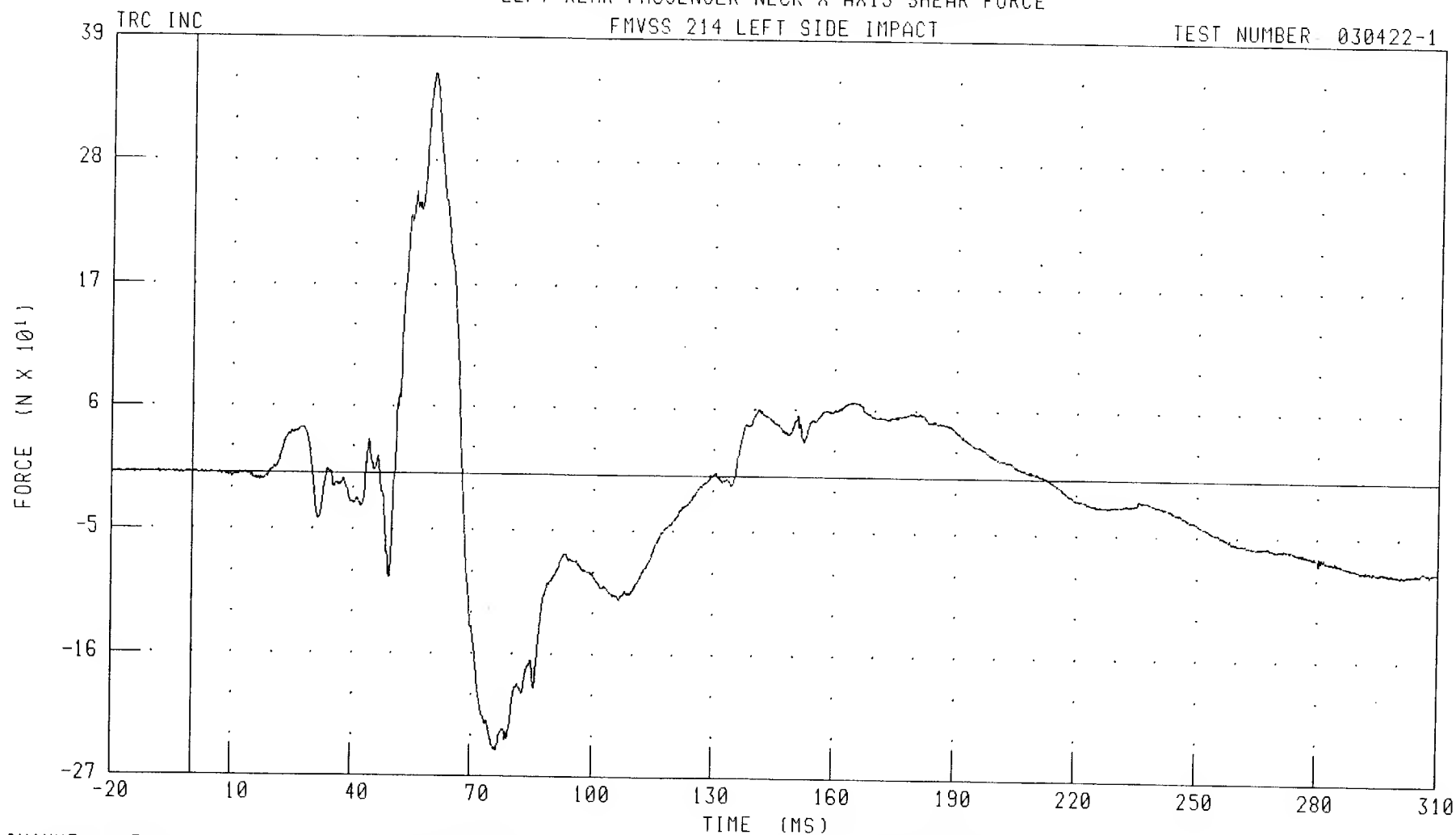
B-38

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT REAR PASSENGER NECK X-AXIS SHEAR FORCE

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: NEKXF4 FILTER: CH CLASS 1000

PEAK DATA: 357.59 N @ 60.00 MS; -246.88 N @ 76.32 MS

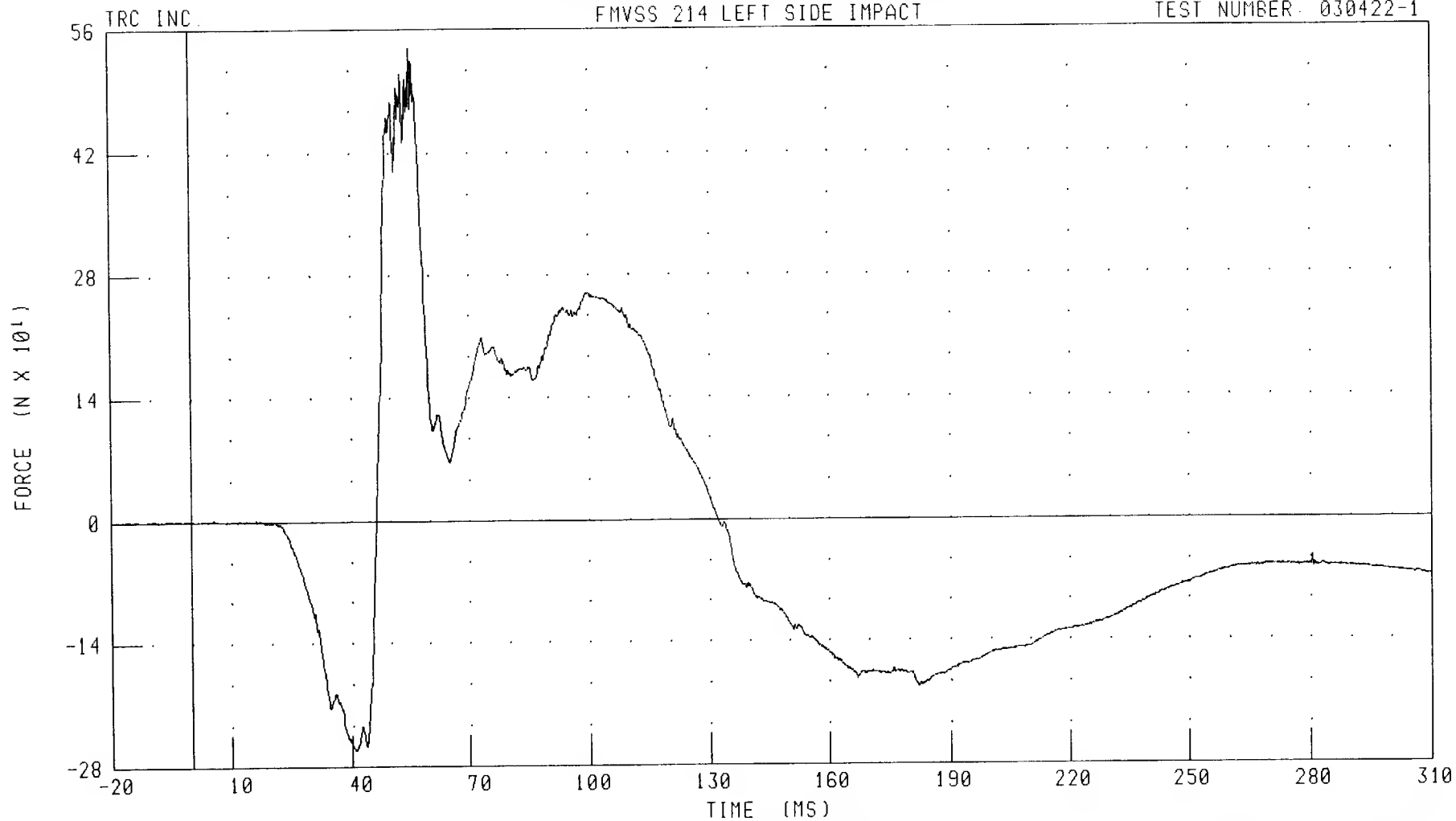
B-39

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT REAR PASSENGER NECK Y-AXIS SHEAR FORCE

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: NEKYF4 FILTER: CH. CLASS 1000

PEAK DATA: 538.47 N @ 55.36 MS, -262.78 N @ 40.88 MS

B-40

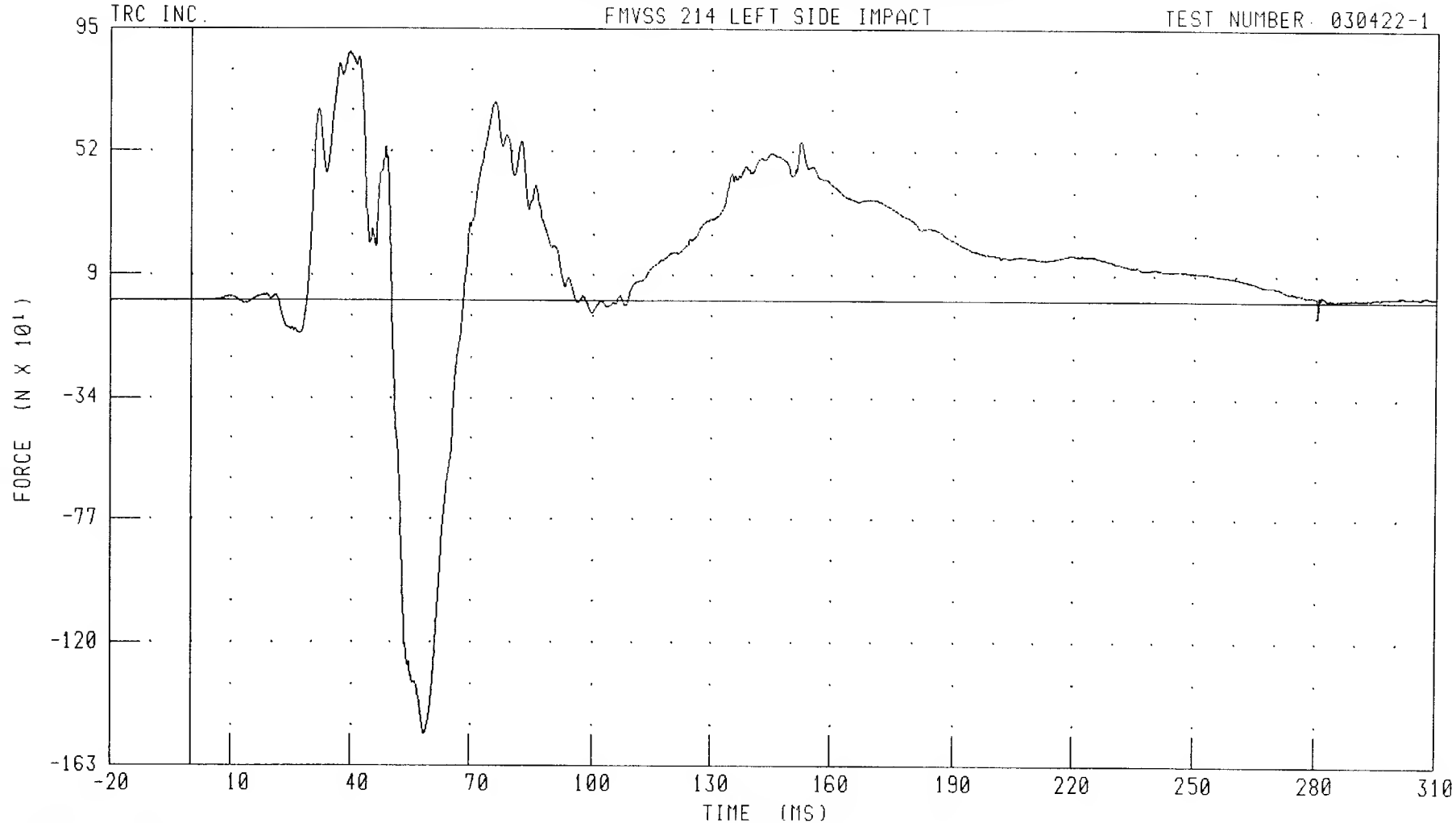
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT REAR PASSENGER NECK Z-AXIS AXIAL FORCE

TRC INC.

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: NEKZF4 FILTER: CH CLASS 1000

PEAK DATA: 869.54 N @ 39.60 MS; -1518.64 N @ 58.64 MS

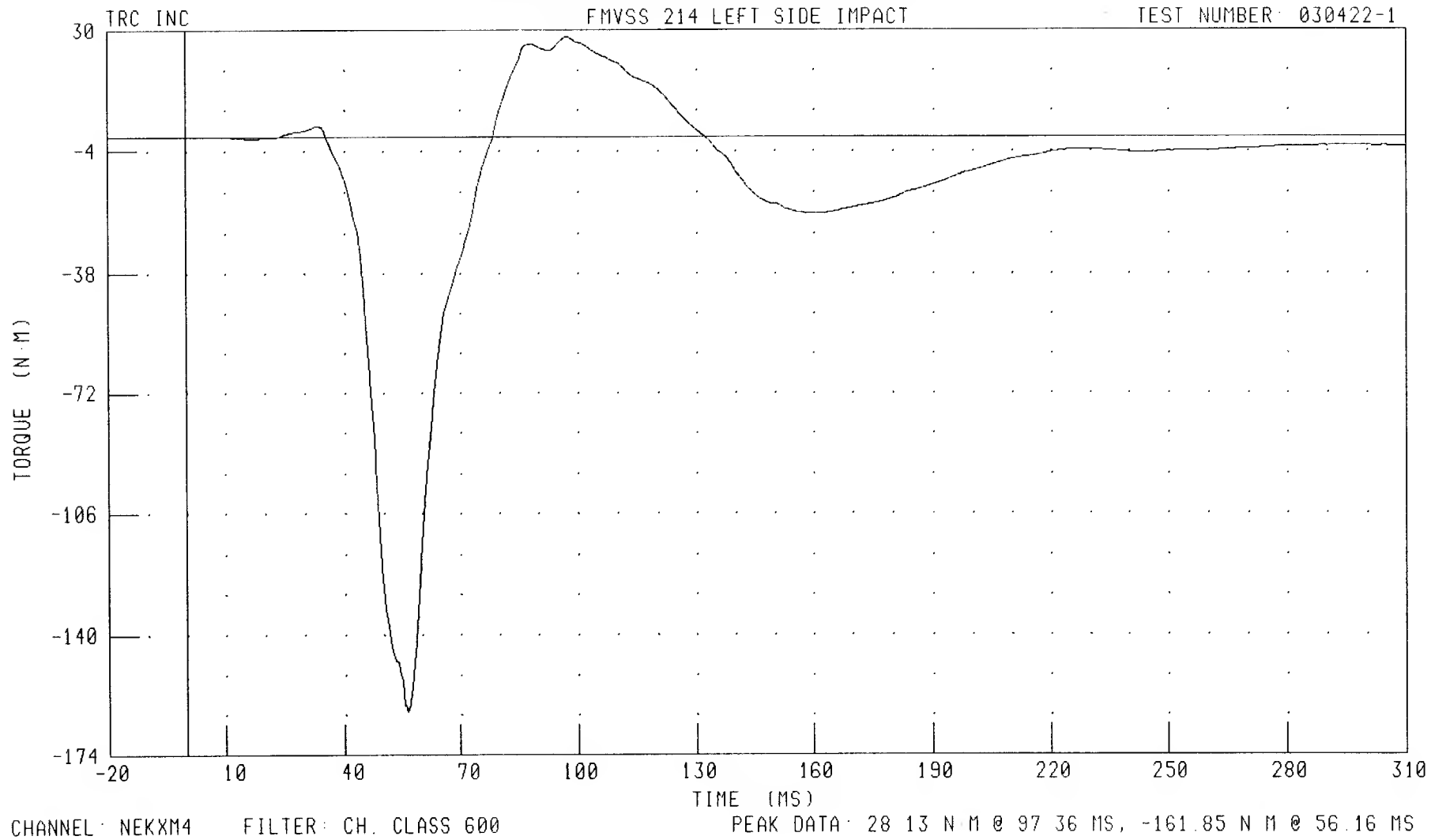
B-41

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT REAR PASSENGER NECK MOMENT ABOUT X AXIS

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



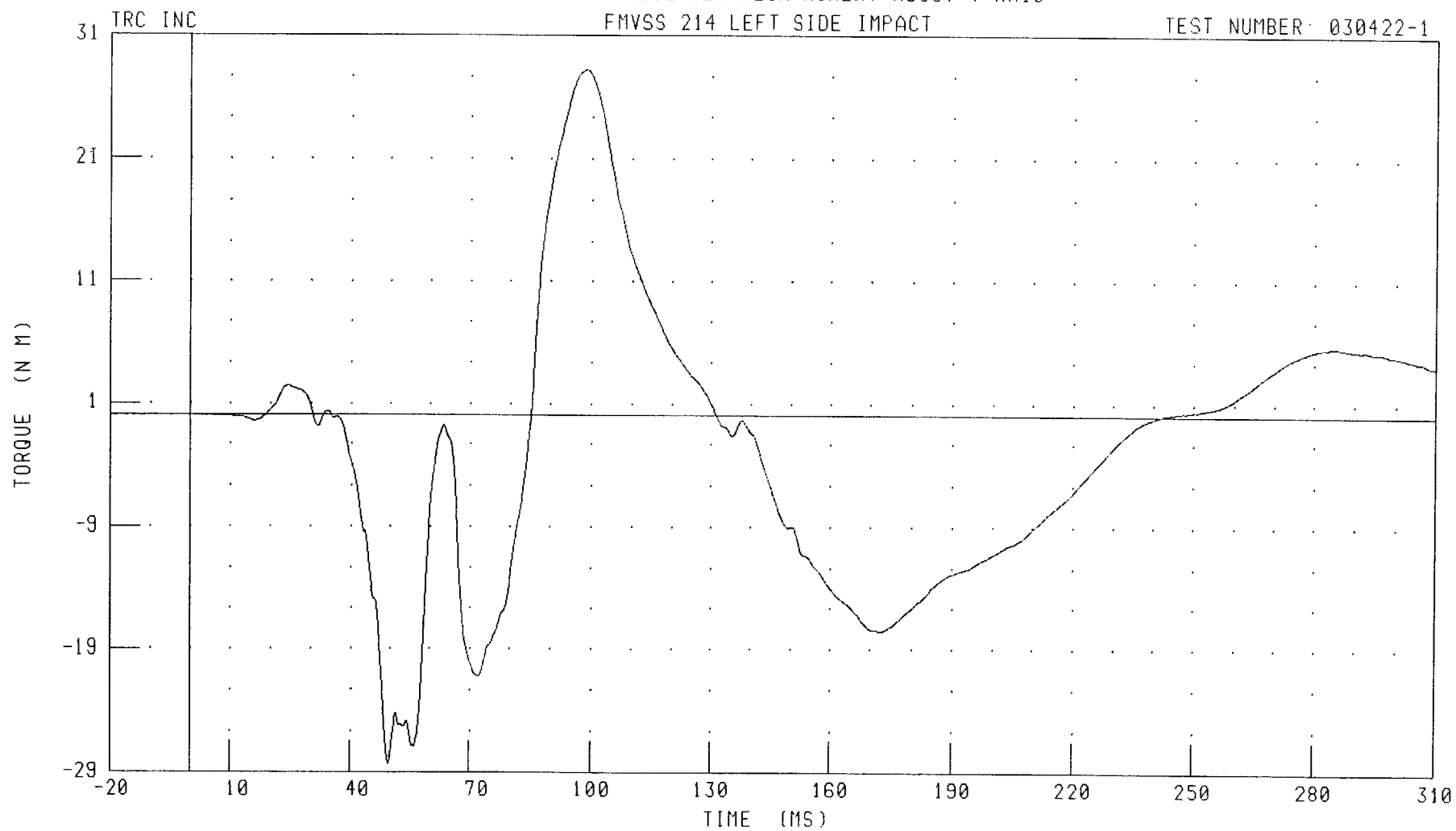
B-42

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT REAR PASSENGER NECK MOMENT ABOUT Y AXIS

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: NEKYM4

FILTER: CH. CLASS 600

PEAK DATA: 28.20 N·M @ 98.72 MS; -28.34 N·M @ 49.68 MS

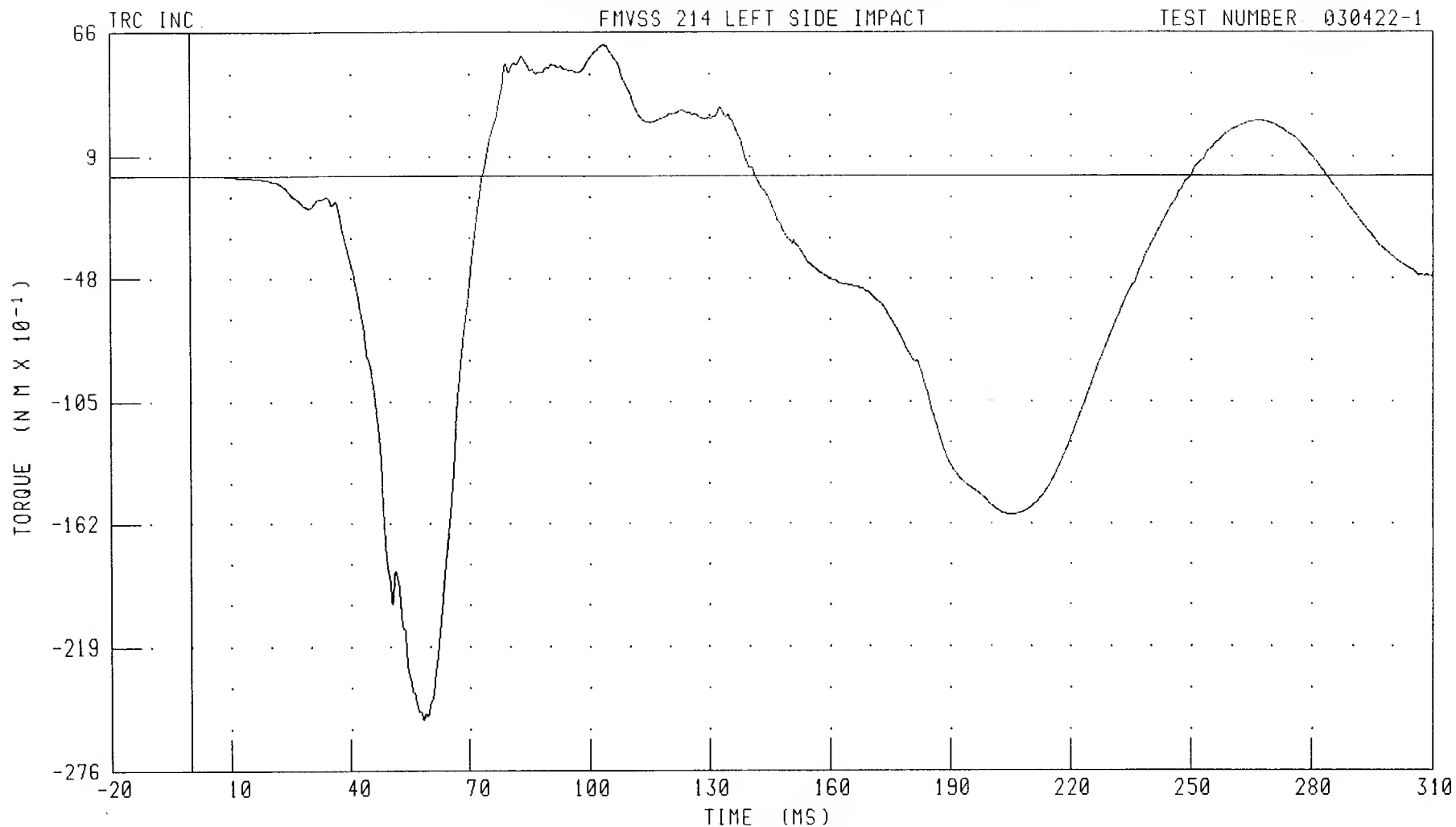
B-43

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT REAR PASSENGER NECK MOMENT ABOUT Z AXIS

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL: NEKZM4 FILTER: CH CLASS 600

PEAK DATA: 6.03 N·m @ 103.60 MS; -25.31 N·m @ 58.40 MS

B44

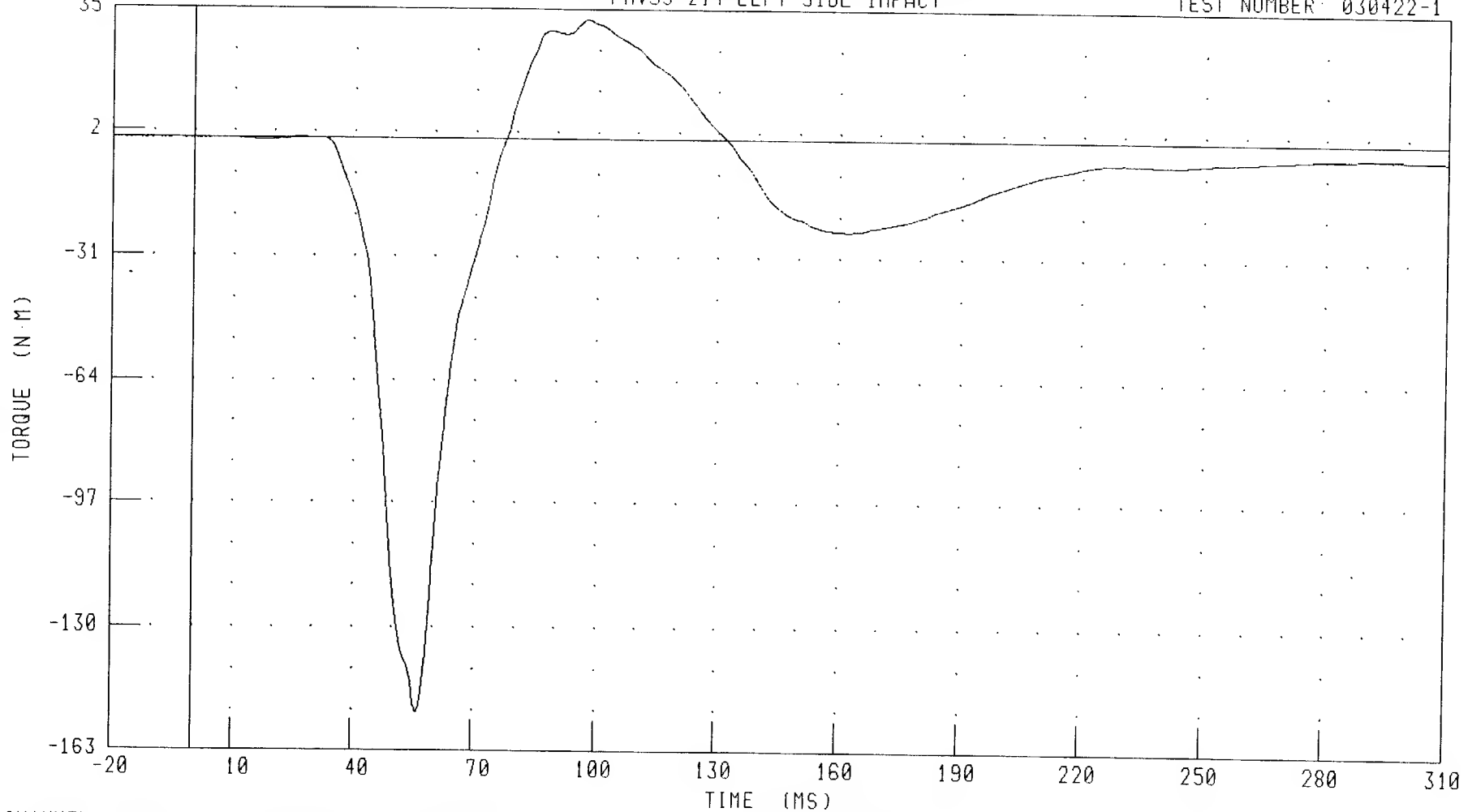
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT REAR PASSENGER NECK OCCIPITAL CONDYLE MOMENT ABOUT X AXIS

TRC INC.

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: NK0XM4

FILTER: CH. CLASS 600

PEAK DATA: 32.34 N·m @ 97.52 ms; -152.78 N·m @ 56.16 ms

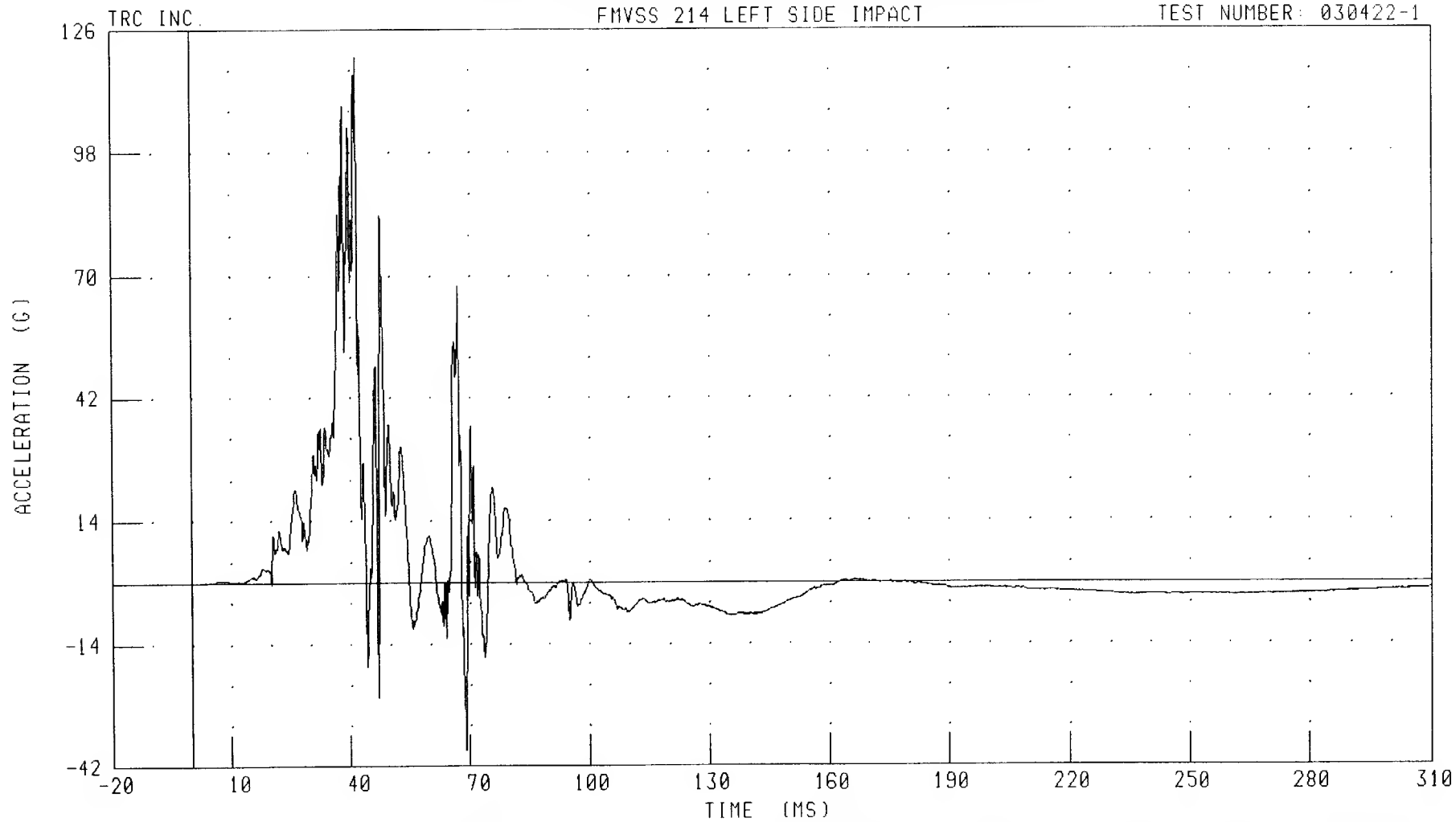
B-45

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT REAR PASSENGER UPPER RIB Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



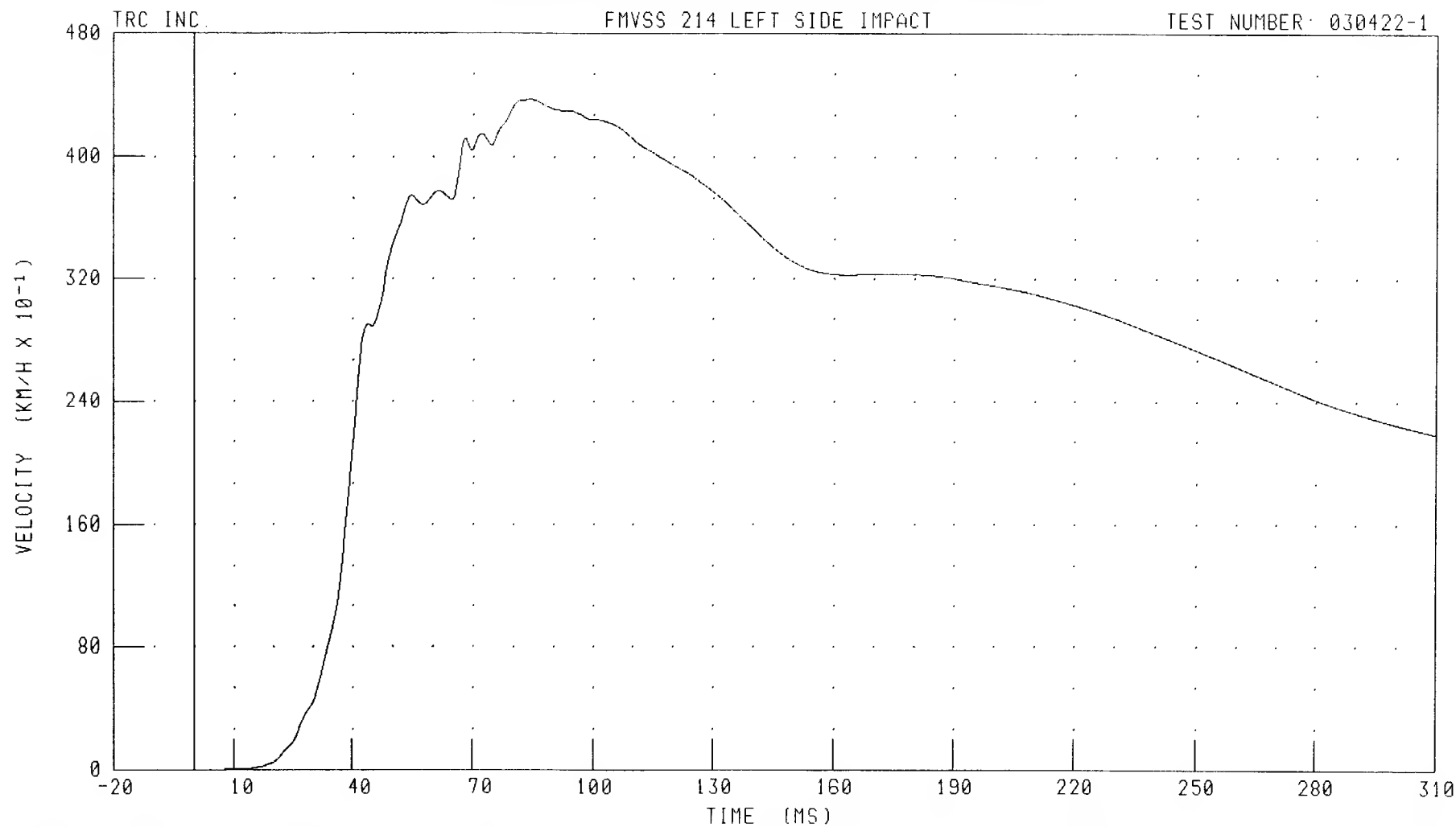
B-46

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT REAR PASSENGER UPPER RIB Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: LURYV4

FILTER: CH. CLASS 180

PEAK DATA: 43 67 KM/H @ 84 00 MS; 0.00 KM/H @ 0 00 MS

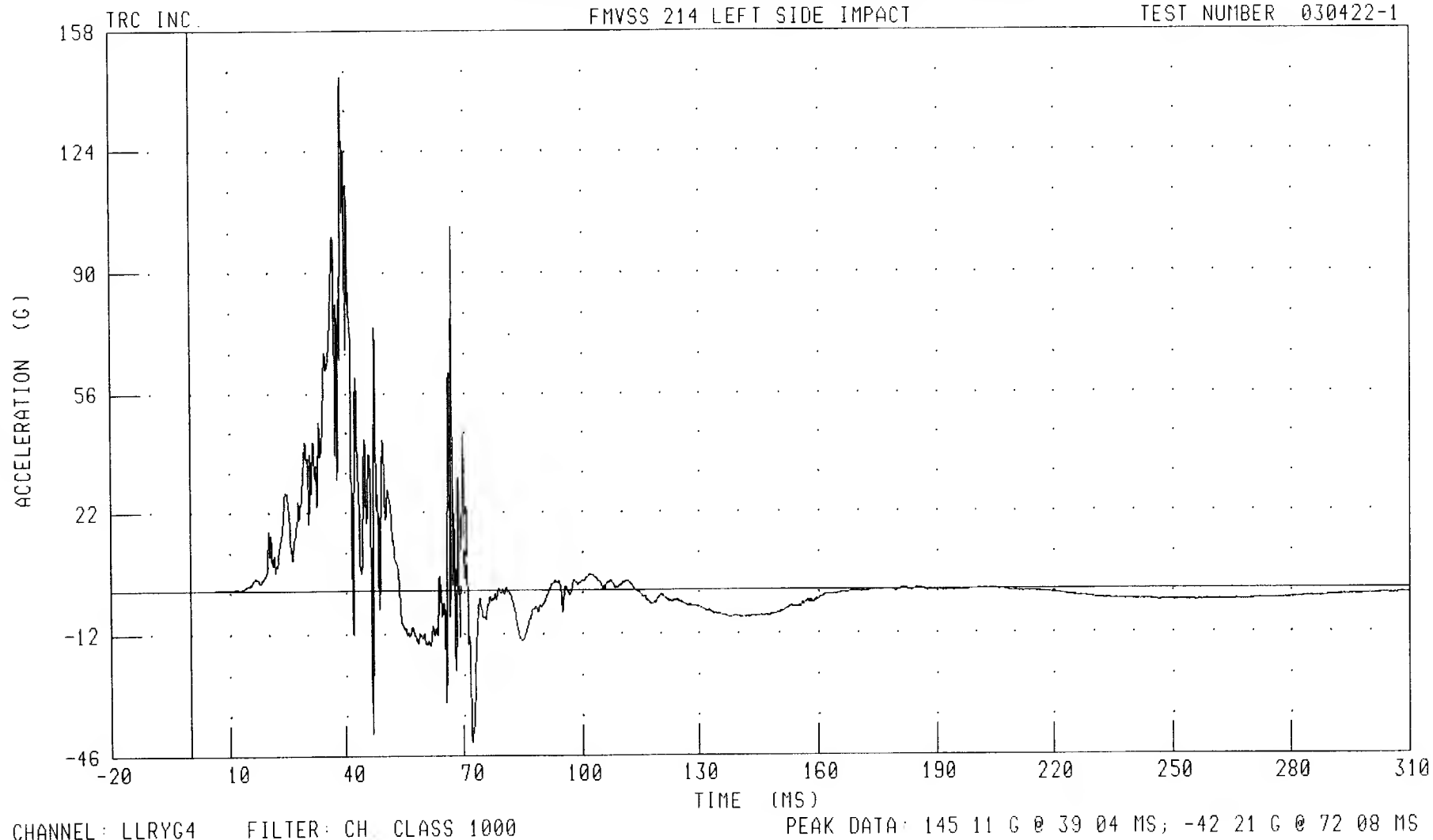
B-47

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT REAR PASSENGER LOWER RIB Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



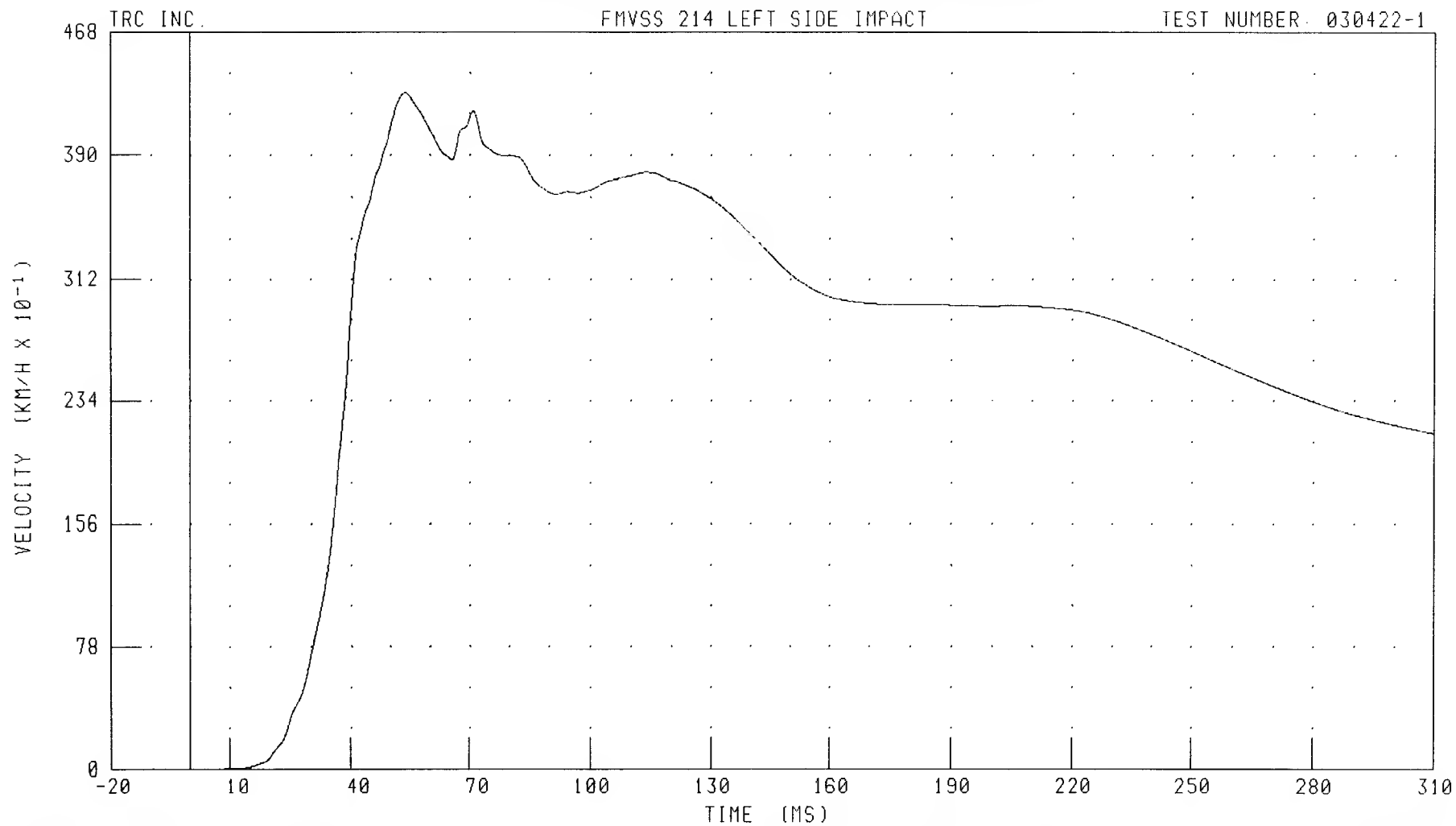
B-48

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT REAR PASSENGER LOWER RIB Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: LLRYV4

FILTER: CH. CLASS 180

PEAK DATA: 42.98 KM/H @ 53.84 MS; 0.00 KM/H @ 0.00 MS

B-49

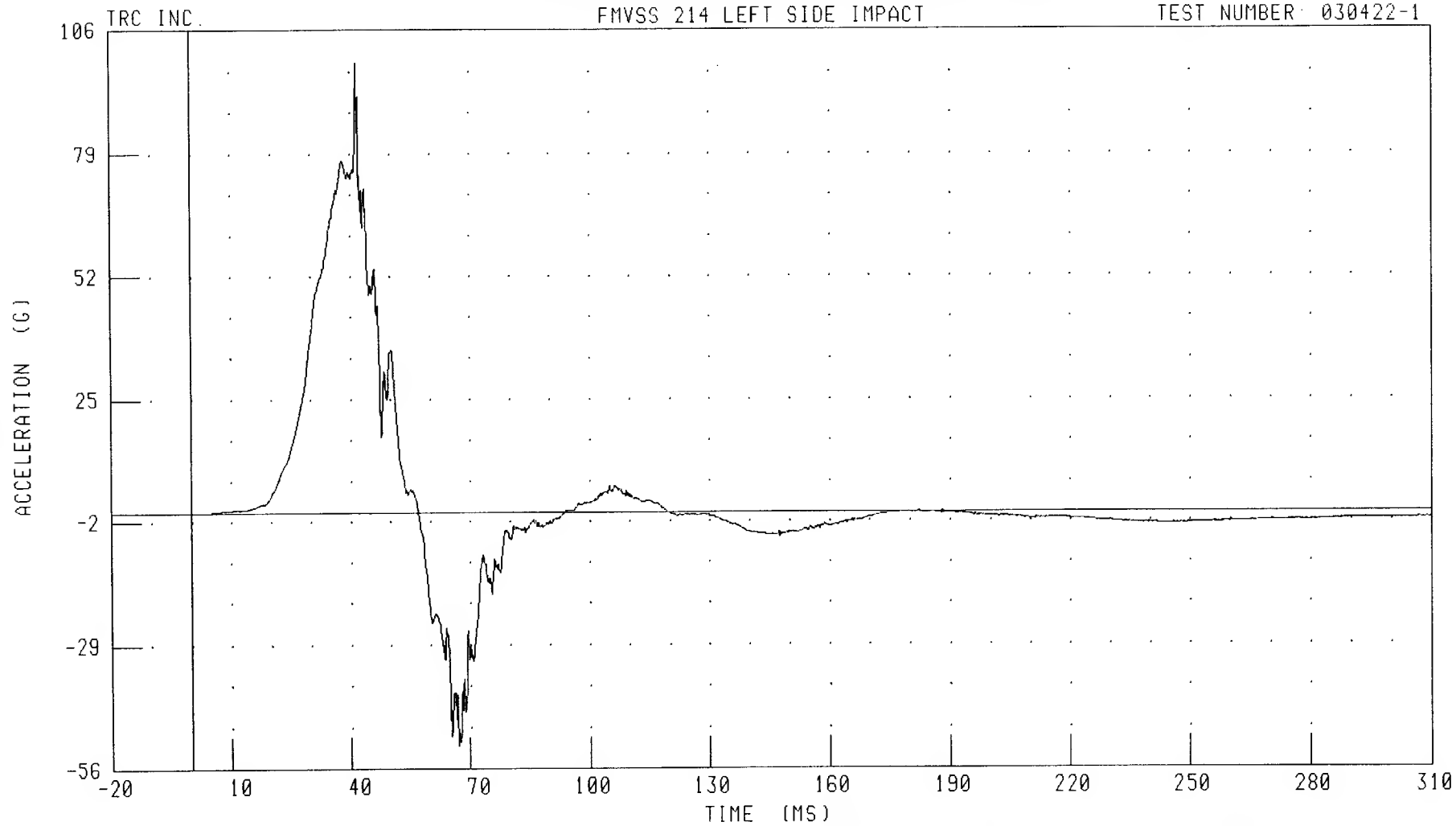
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

LEFT REAR PASSENGER LOWER SPINE Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



B-50

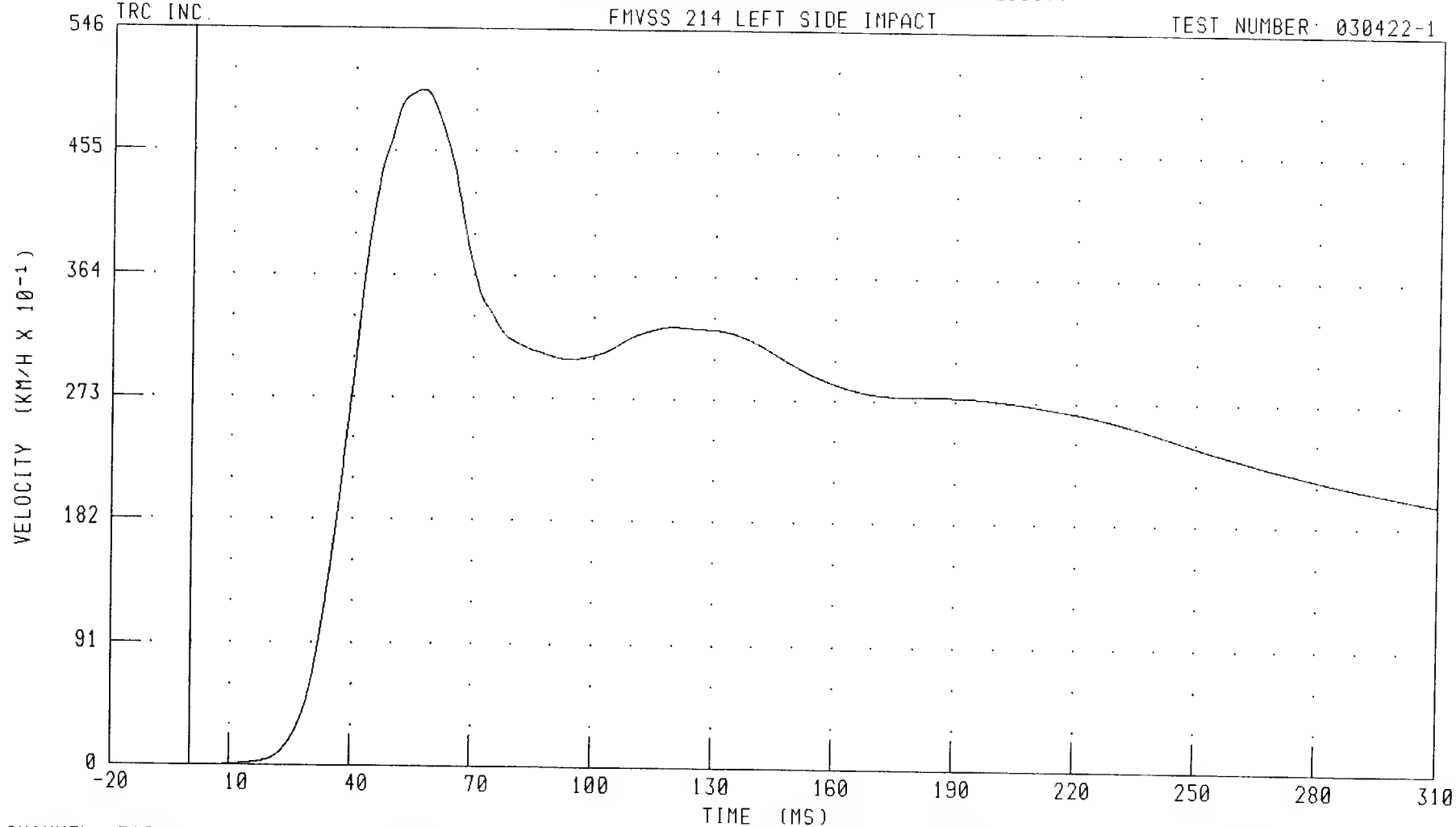
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT REAR PASSENGER LOWER SPINE Y-AXIS VELOCITY

TRC INC.

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: T12YV4

FILTER: CH. CLASS 180

PEAK DATA: 50 02 KM/H @ 57.04 MS; 0 00 KM/H @ 0.00 MS

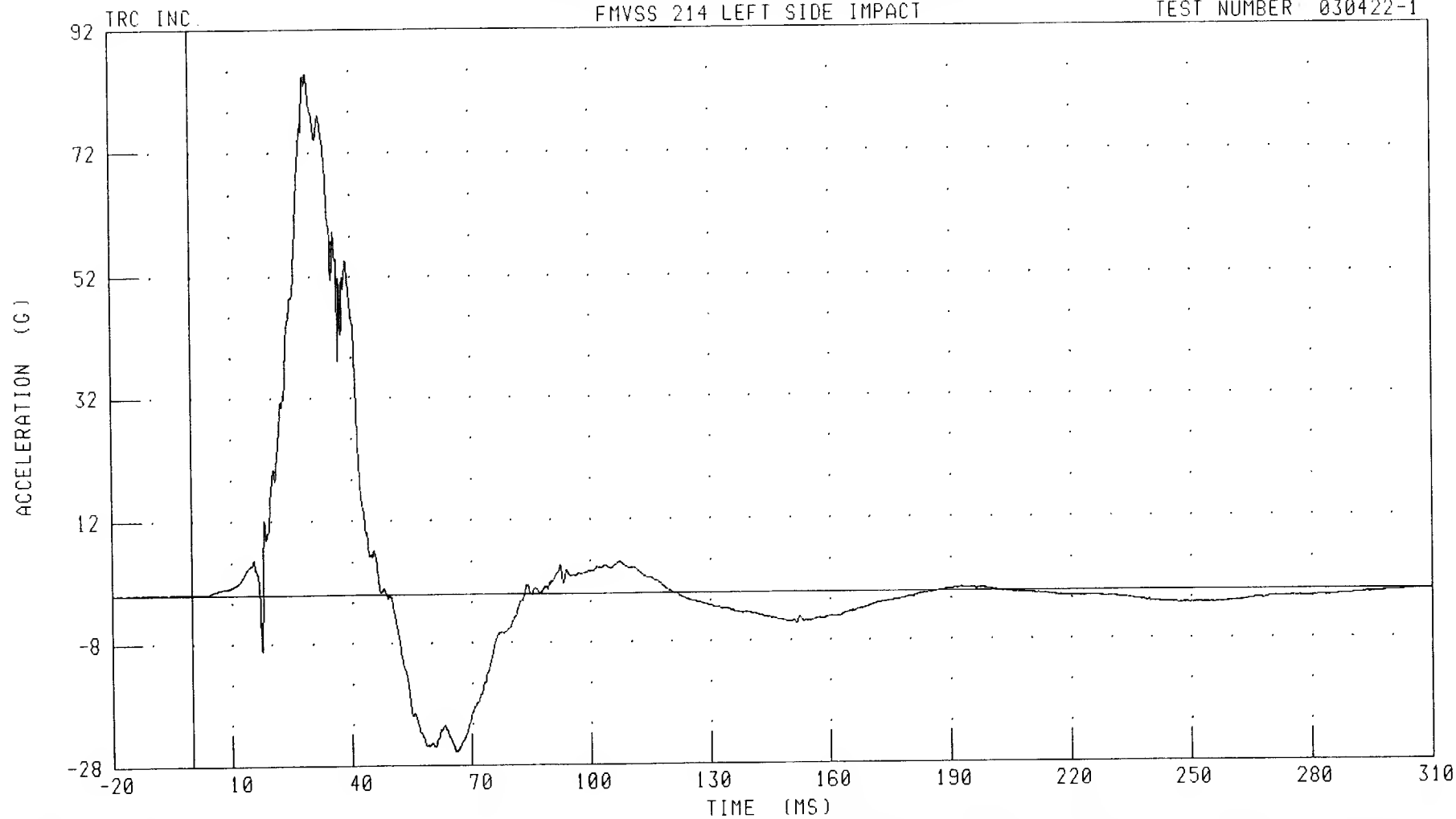
B-51

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT REAR PASSENGER PELVIS Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL: PEVYG4 FILTER: CH. CLASS 1000

PEAK DATA 84.81 G @ 29.44 MS; -25.79 G @ 66.08 MS

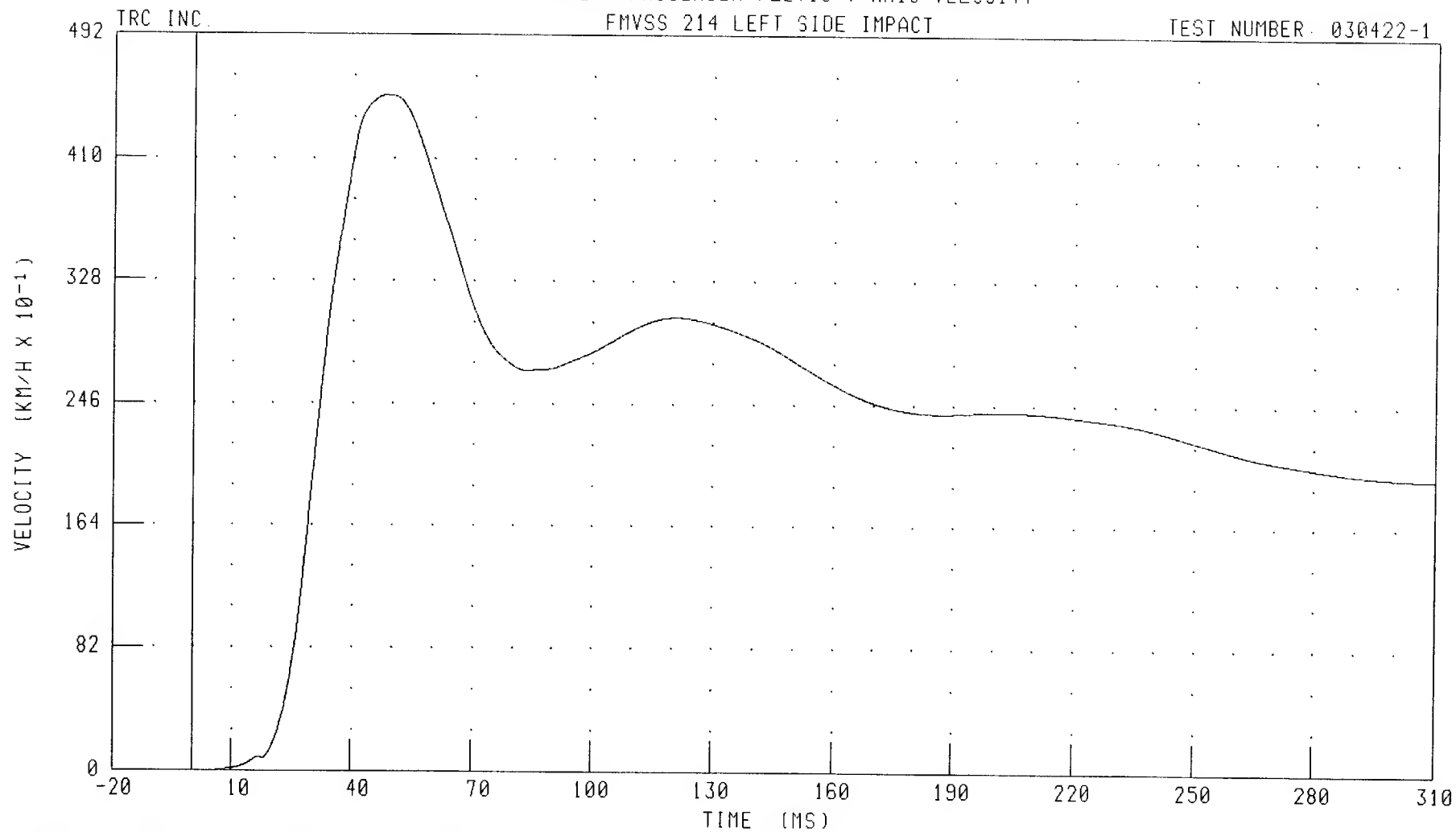
B-52

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT REAR PASSENGER PELVIS Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: PEVYV4 FILTER: CH. CLASS 180

PEAK DATA: 45.18 KM/H @ 48.88 MS; 0.00 KM/H @ 0.00 MS

B-53

030422-1

Driver and Passenger Dummy Instrumentation Plots

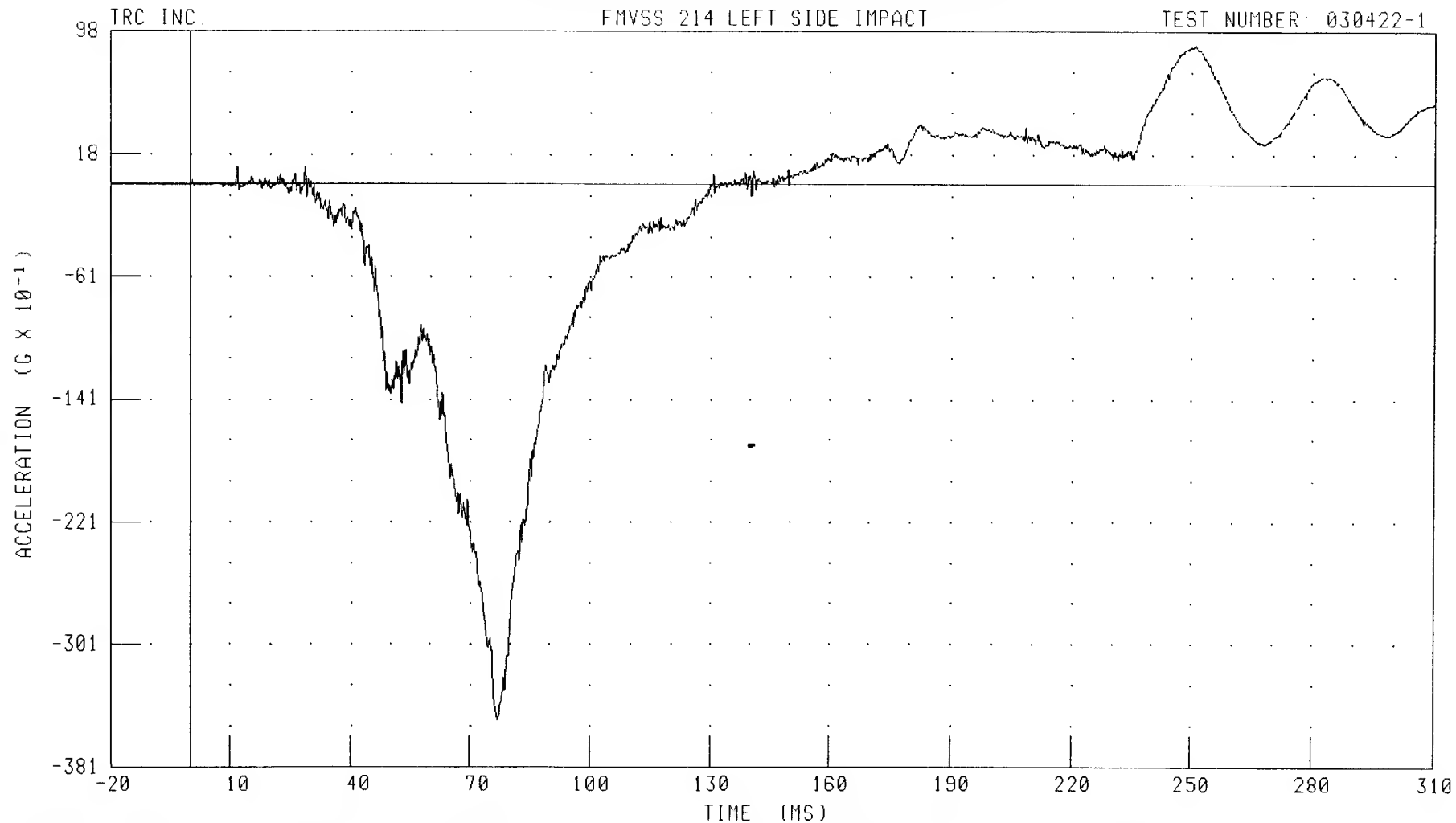
Acceleration Data - Filter Class 1000 - Redundant

Integration Data - Filter Class 180 - Redundant

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
DRIVER HEAD X-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: HEDXR1

FILTER: CH. CLASS 1000

PEAK DATA: 9.03 G @ 250.96 MS; -35.04 G @ 77.04 MS

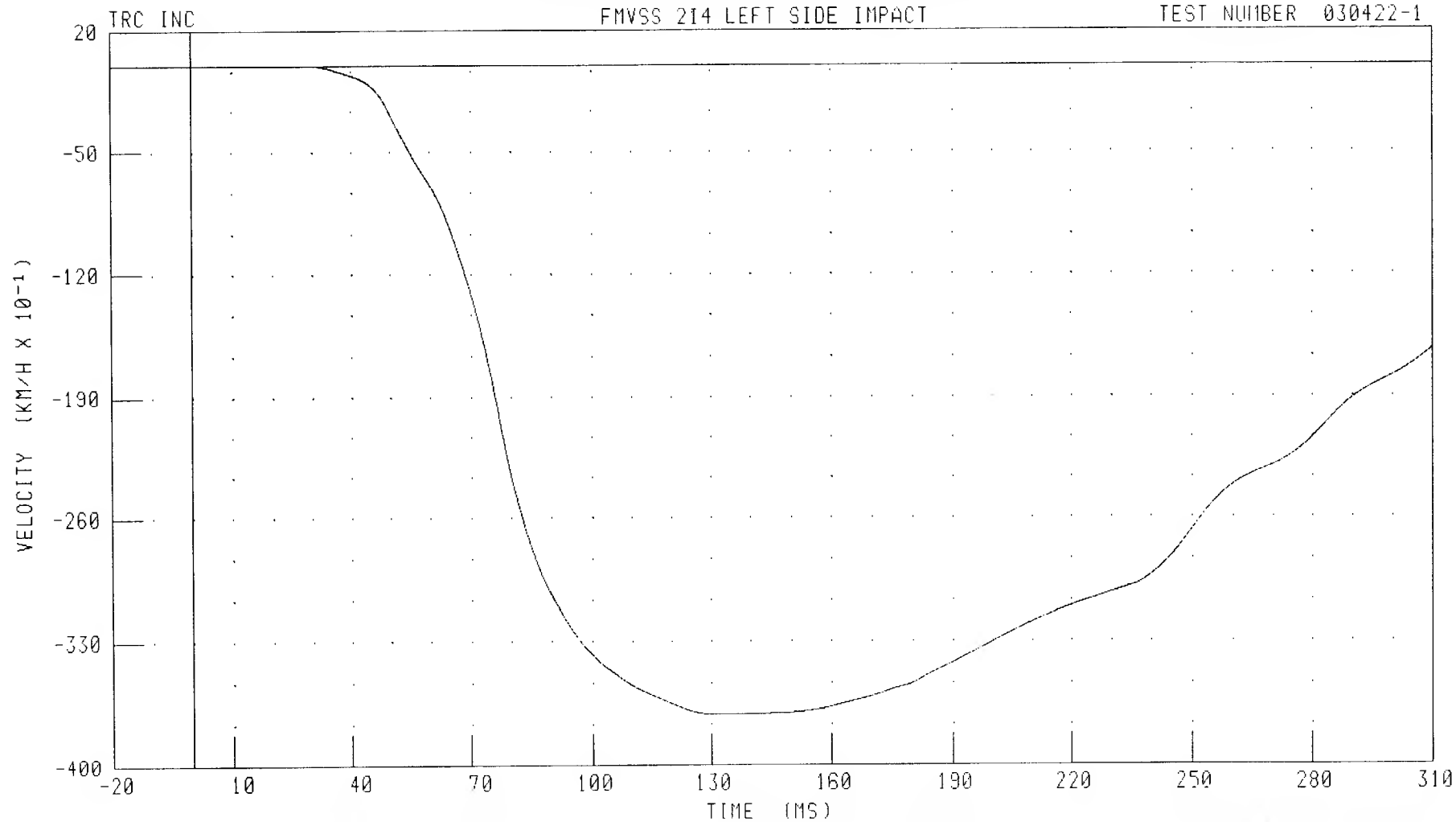
B-55

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
DRIVER HEAD X-AXIS REDUNDANT VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL: HEDXVI FILTER: CH CLASS 180

PEAK DATA 0 03 KM/H @ 23 52 MS, -37 13 KM/H @ 134 80 MS

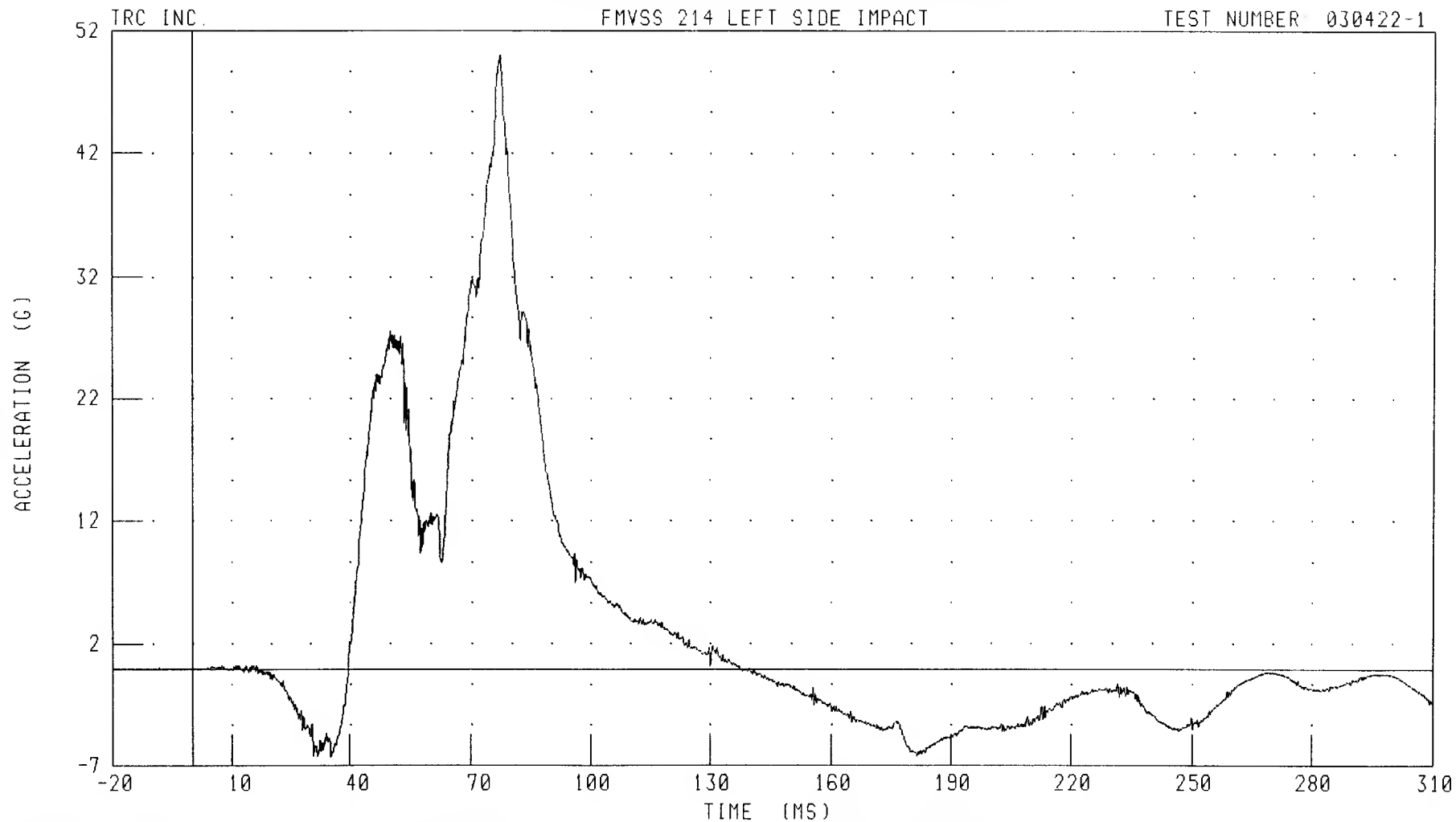
B-56

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
DRIVER HEAD Y-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL: HEDYR1 FILTER: CH. CLASS 1000

PEAK DATA: 50.11 G @ 77.12 MS; -7.21 G @ 35.20 MS

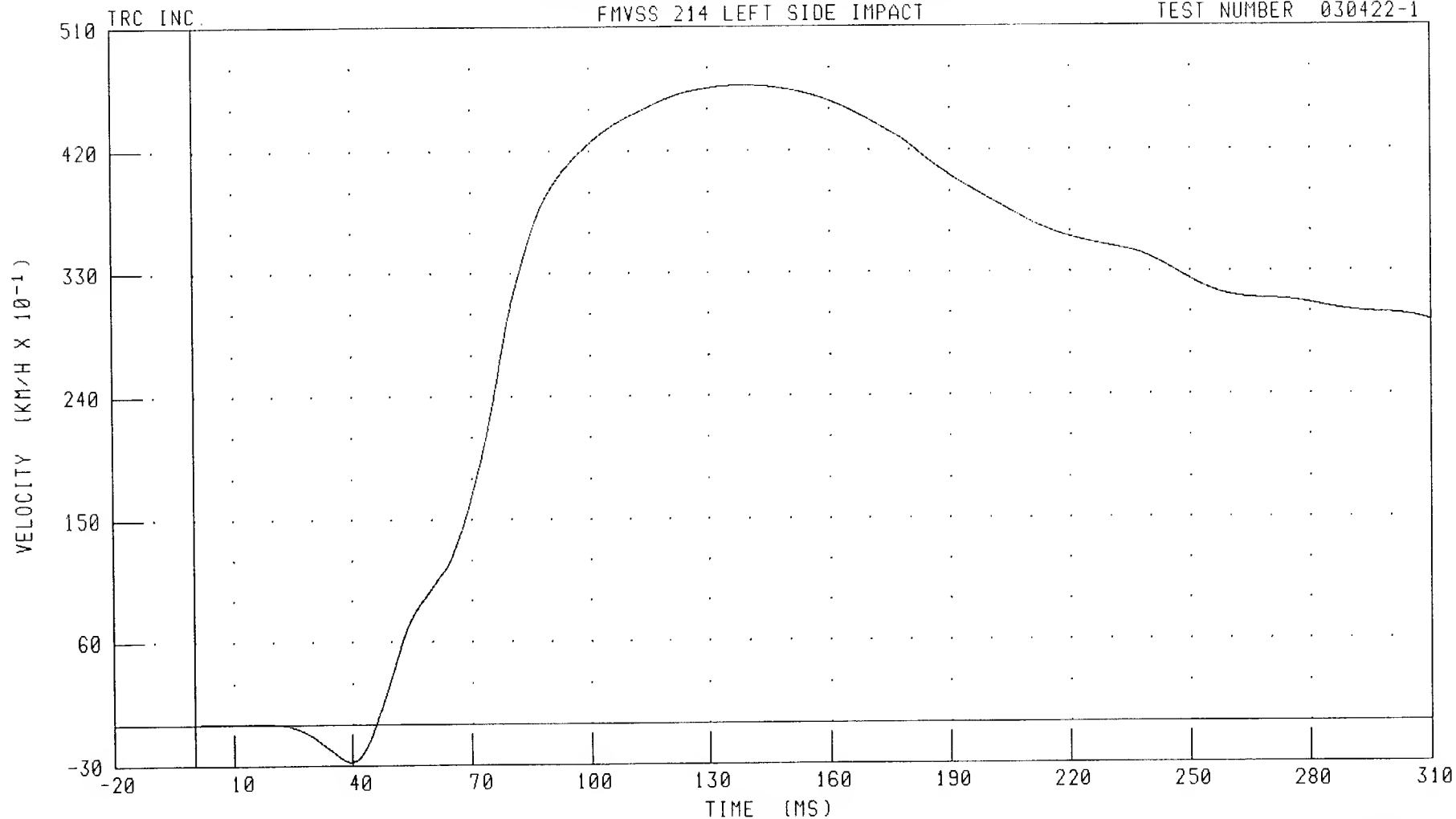
B-57

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
DRIVER HEAD Y-AXIS REDUNDANT VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL: HEDYVI FILTER: CH CLASS 180

PEAK DATA: 46.74 KM/H @ 137.76 MS, -2.76 KM/H @ 39.60 MS

B-58

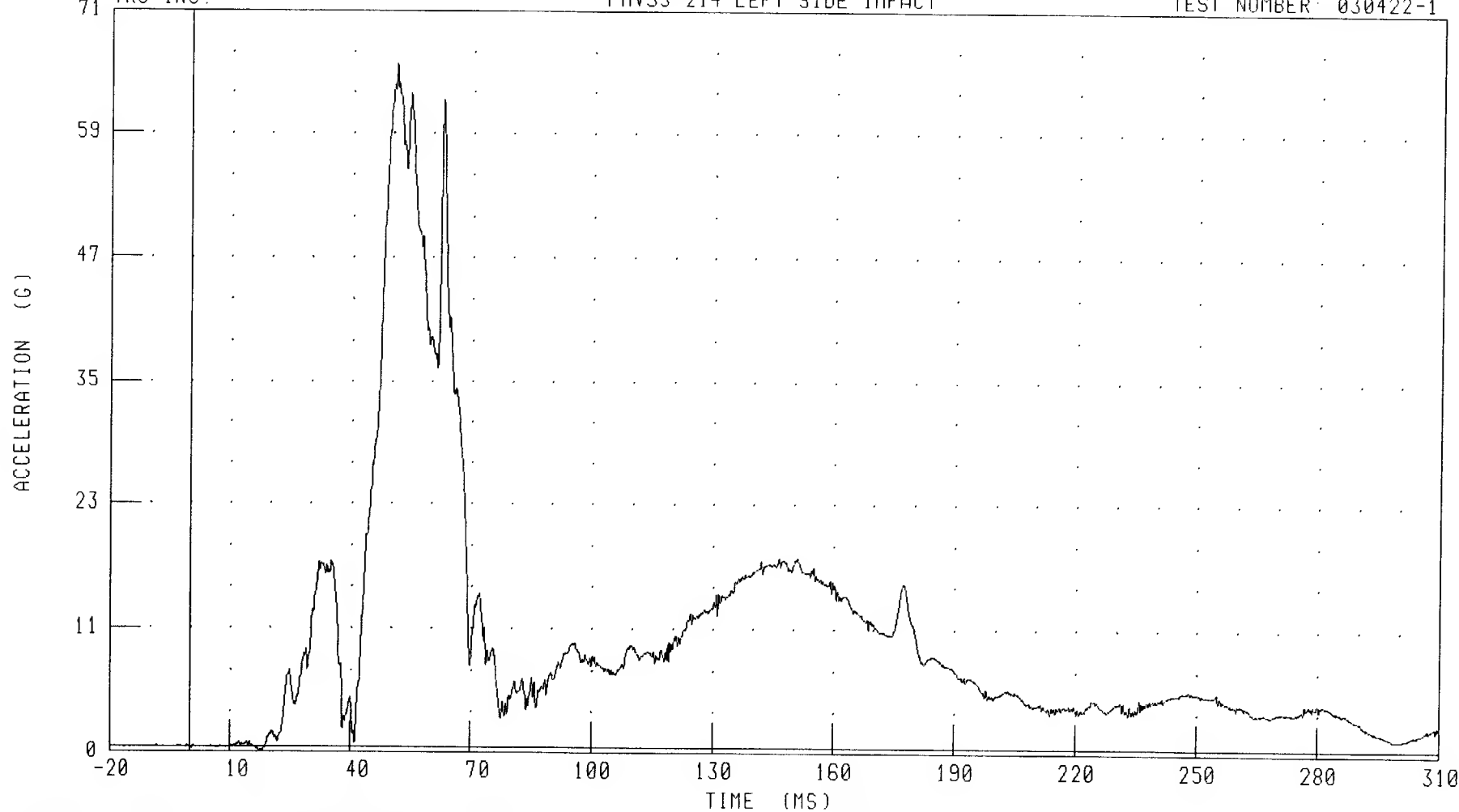
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
DRIVER HEAD Z-AXIS REDUNDANT ACCELERATION

TRC INC.

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: HEDZR1 FILTER: CH. CLASS 1000

PEAK DATA: 66.35 G @ 50.88 MS, -0.50 G @ 17.36 MS

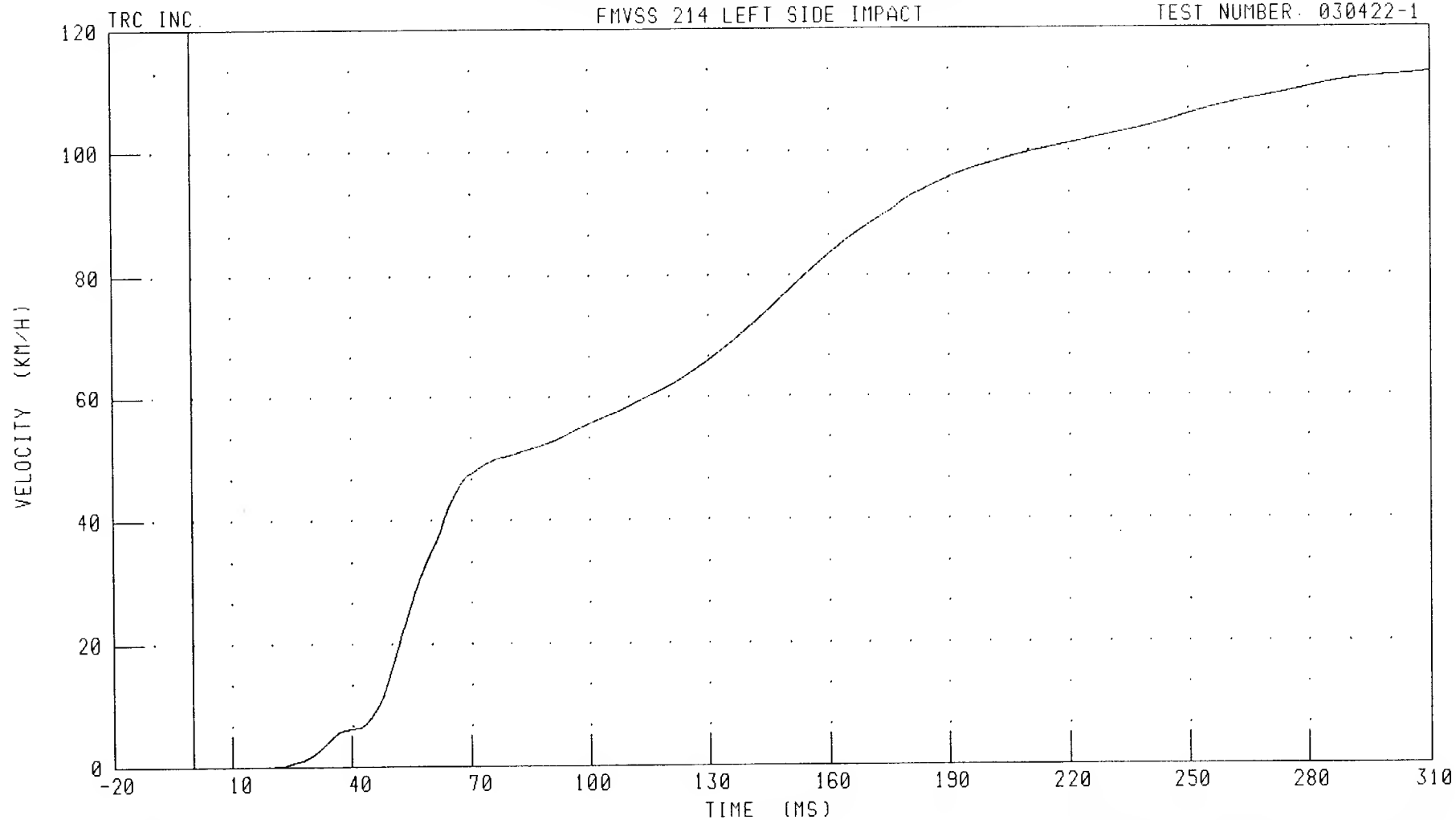
B-59

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
DRIVER HEAD Z-AXIS REDUNDANT VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: HEDZVI FILTER: CH. CLASS 180

PEAK DATA: 112.63 KM/H @ 310.00 MS, 0.00 KM/H @ 3.84 MS

B-60

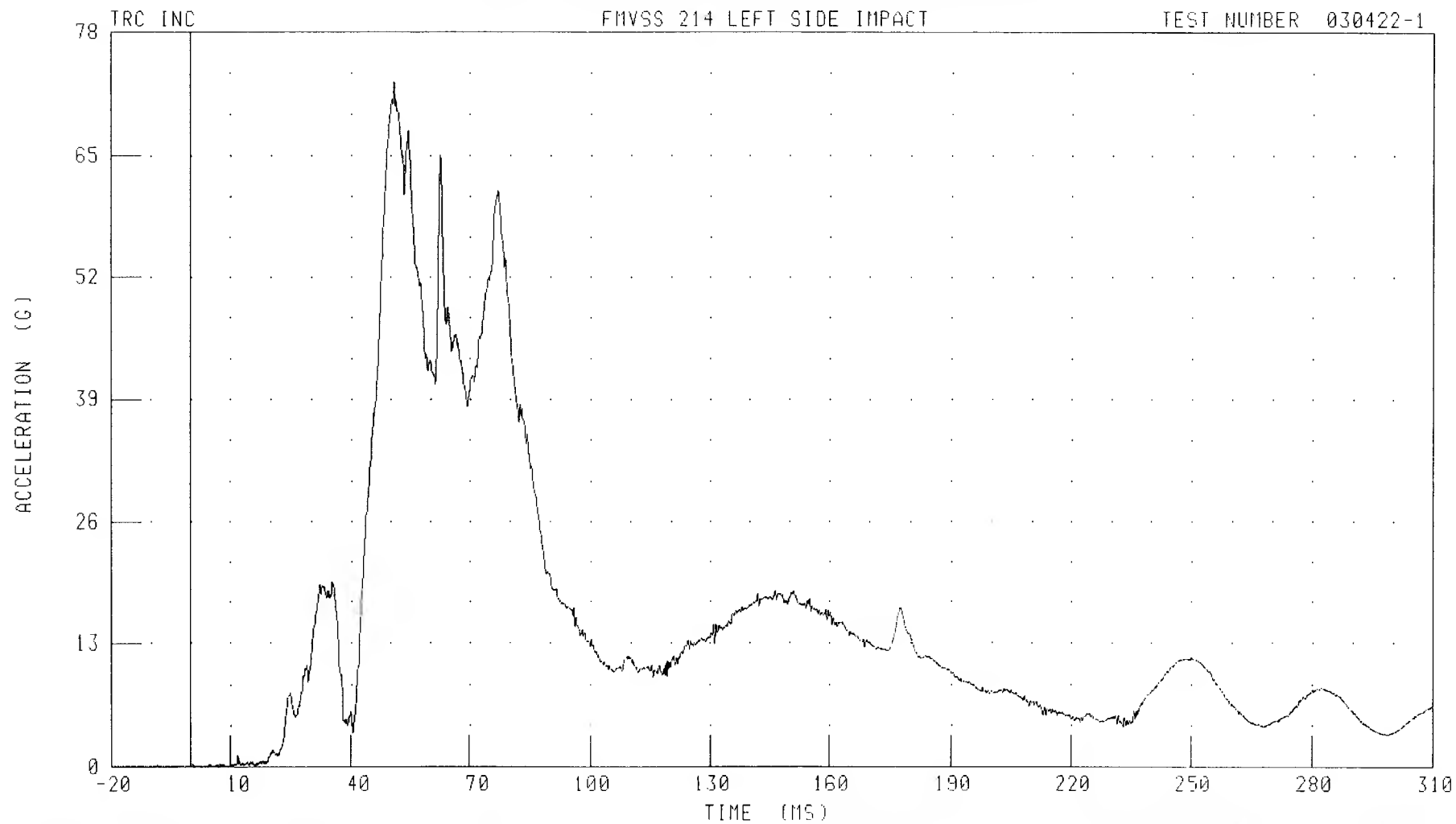
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

DRIVER HEAD RESULTANT REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL HEDRR1 FILTER CH CLASS 1000

PEAK DATA 72 77 G @ 50 88 MS, 0 01 G @ -16 16 MS

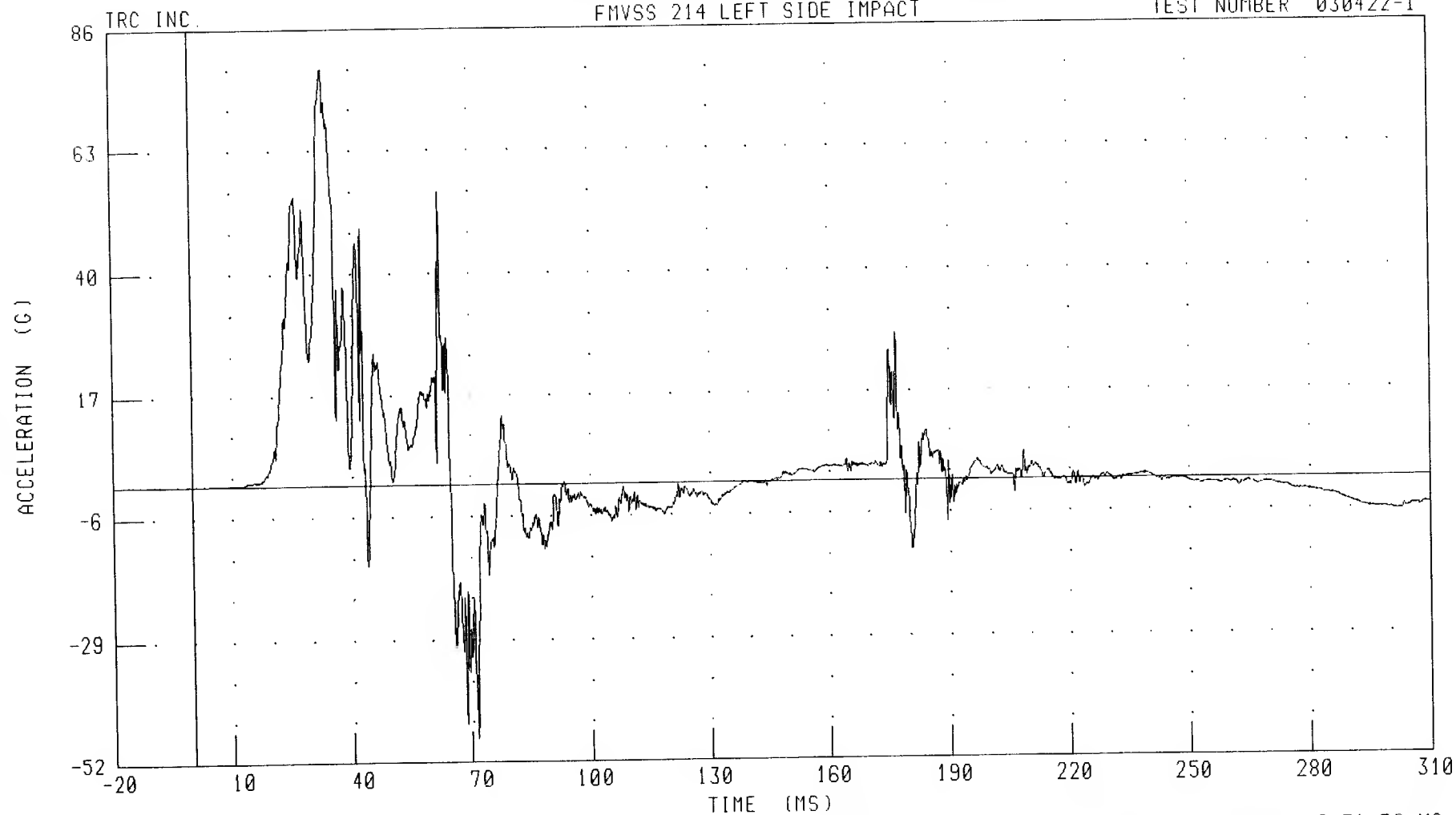
B-61

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
DRIVER UPPER RIB Y-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



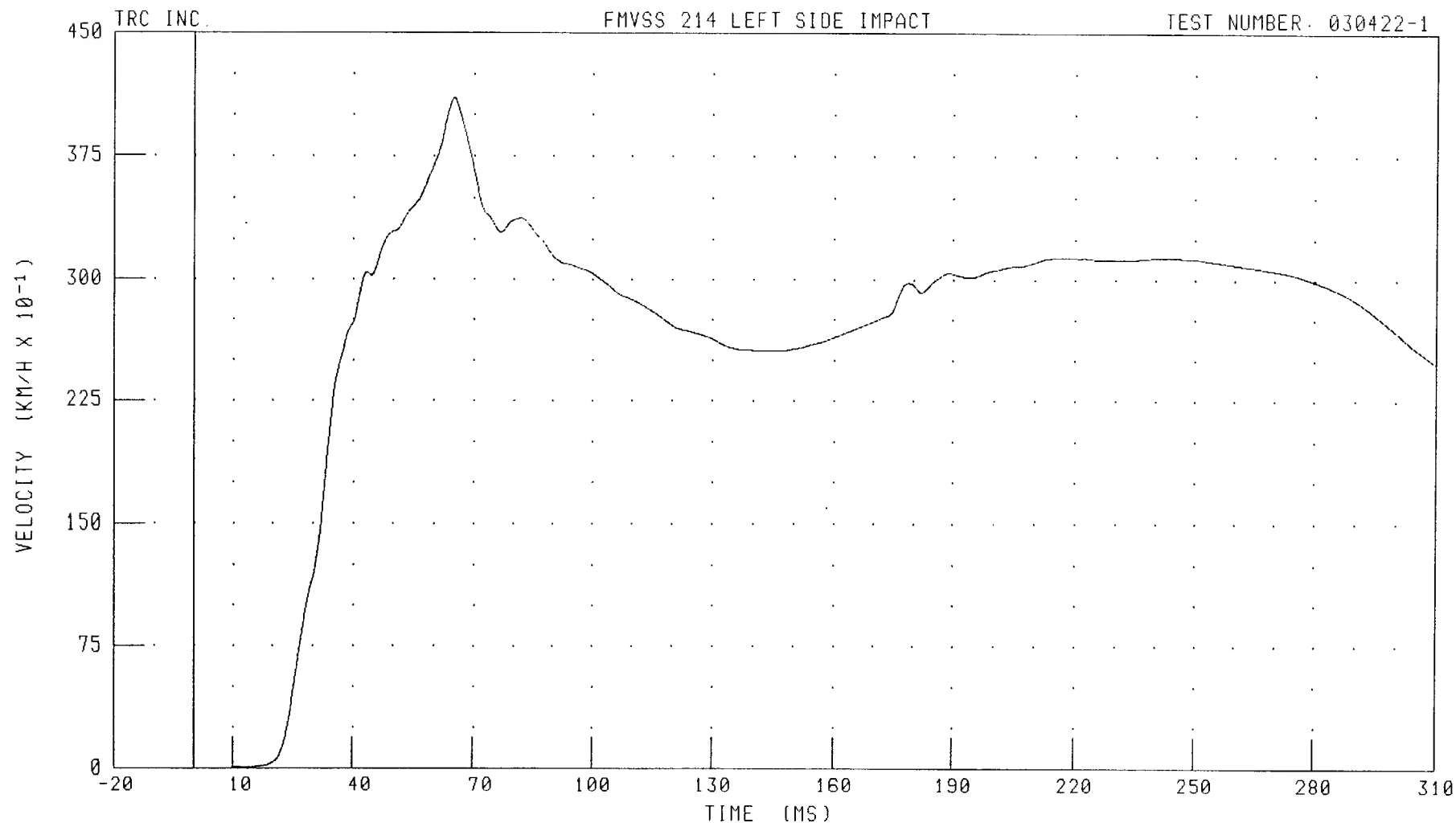
B-62

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
DRIVER UPPER RIB Y-AXIS REDUNDANT VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: LURYVI FILTER: CH. CLASS 180

PEAK DATA: 41 08 KM/H @ 65 04 MS, 0 00 KM/H @ 0.00 MS

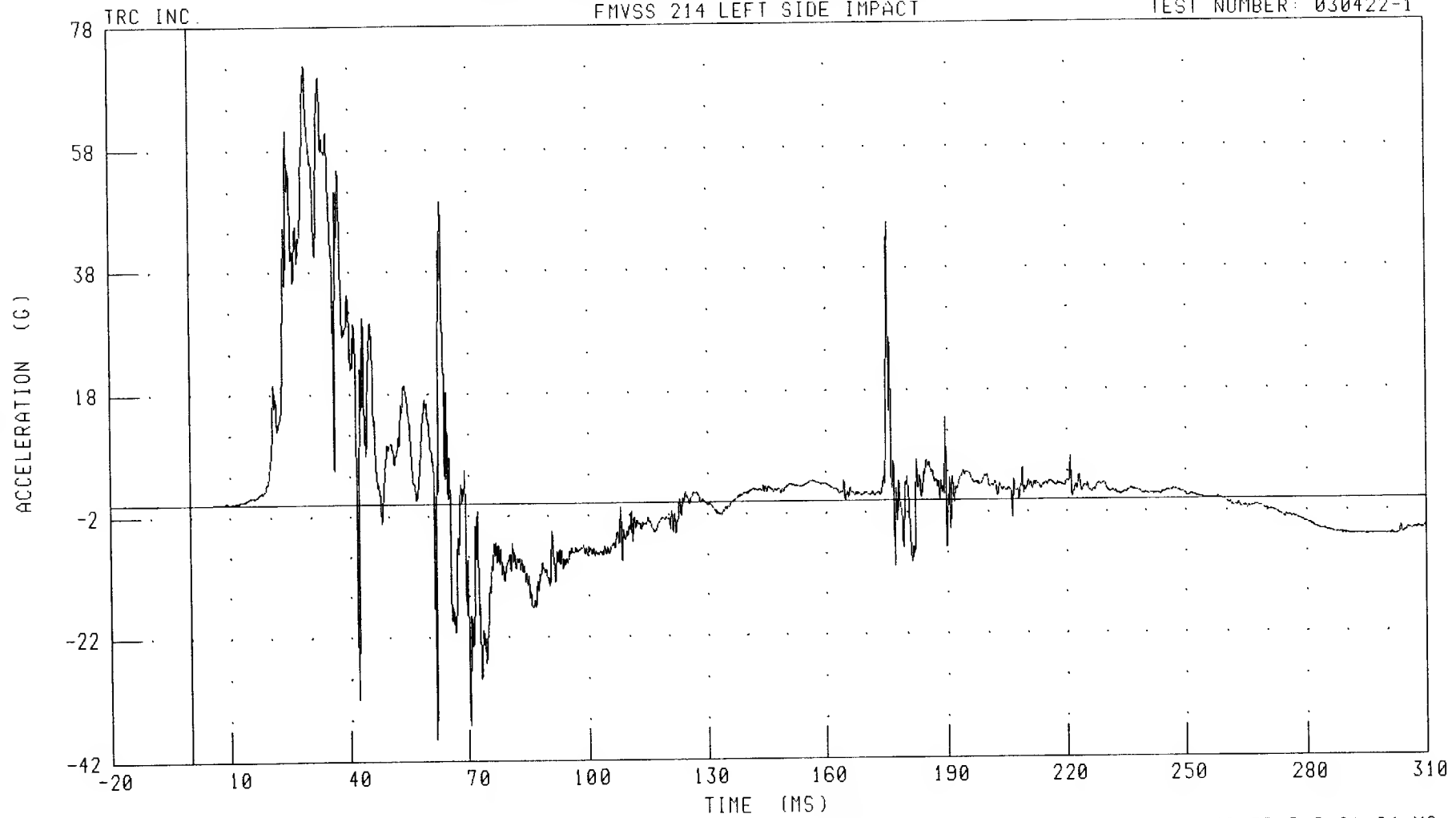
B-63

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
DRIVER LOWER RIB Y-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: LLRYR1 FILTER: CH. CLASS 1000

B-64

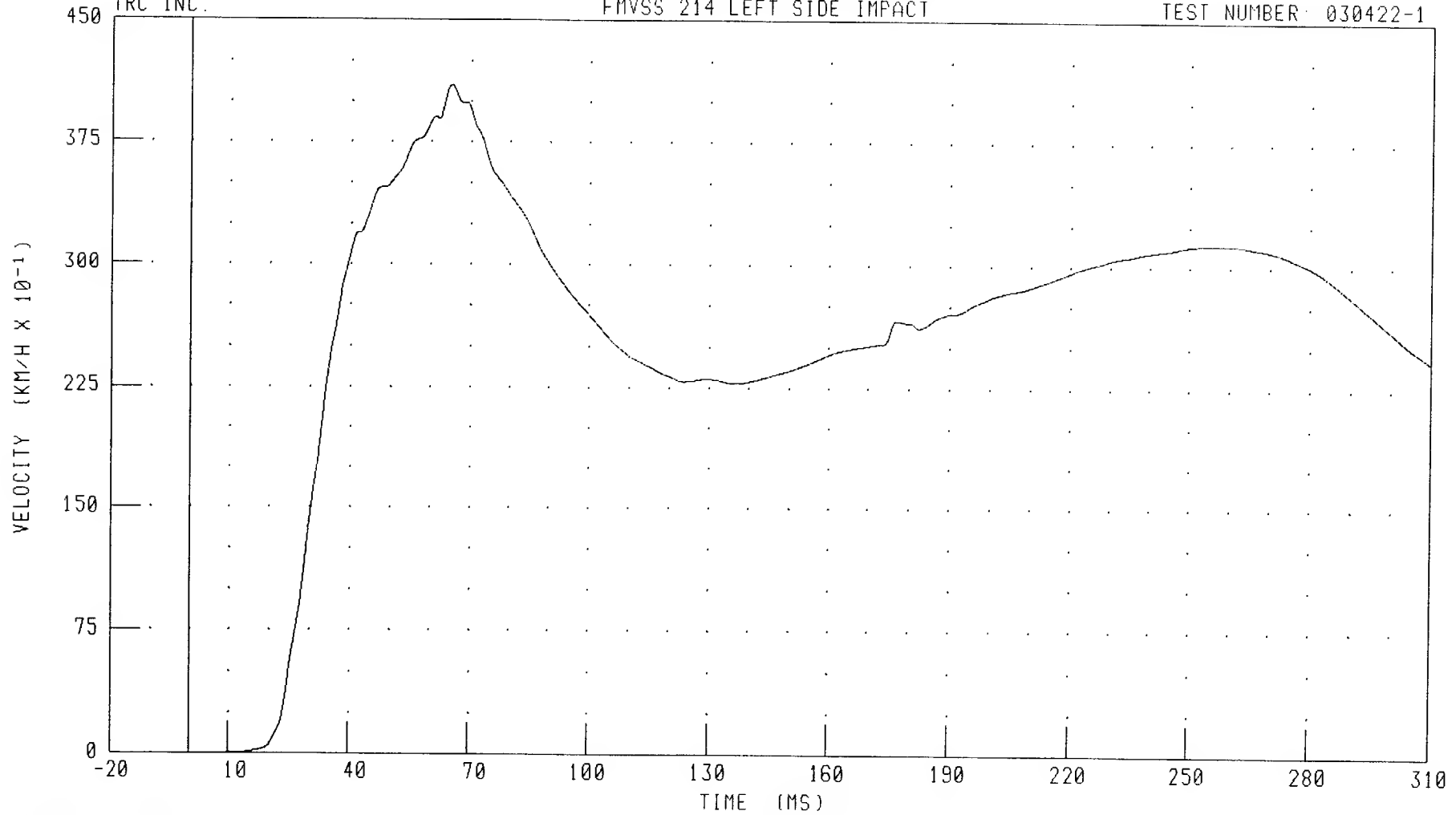
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
DRIVER LOWER RIB Y-AXIS REDUNDANT VELOCITY

TRC INC.

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: LLRYVI FILTER: CH. CLASS 180

PEAK DATA: 41 03 KM/H @ 65 20 MS; 0 00 KM/H @ 0 00 MS

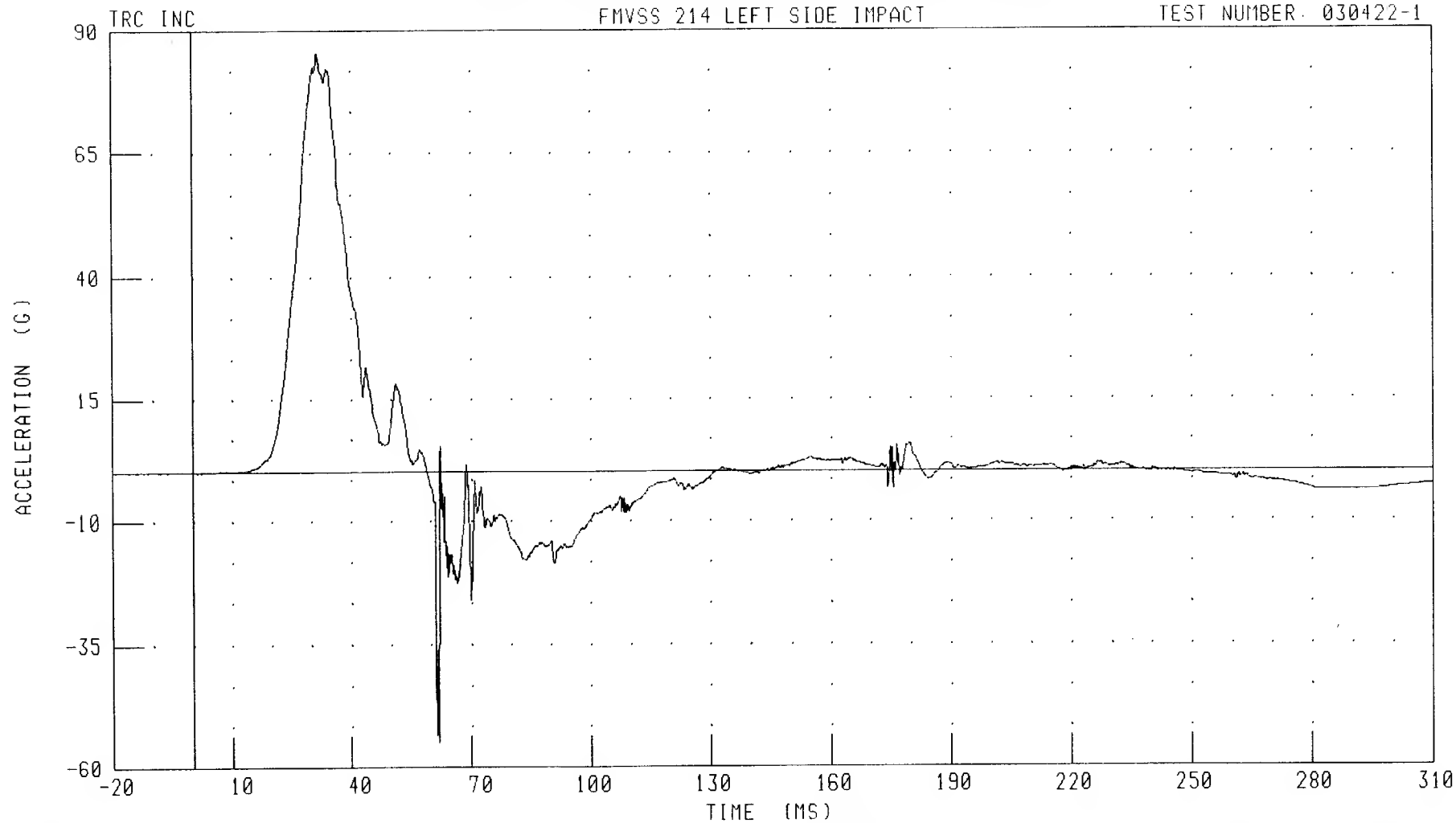
B-65

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
DRIVER LOWER SPINE Y-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: T12YR1 FILTER: CH CLASS 1000

PEAK DATA: 85.42 G @ 31.76 MS; -54.86 G @ 61.92 MS

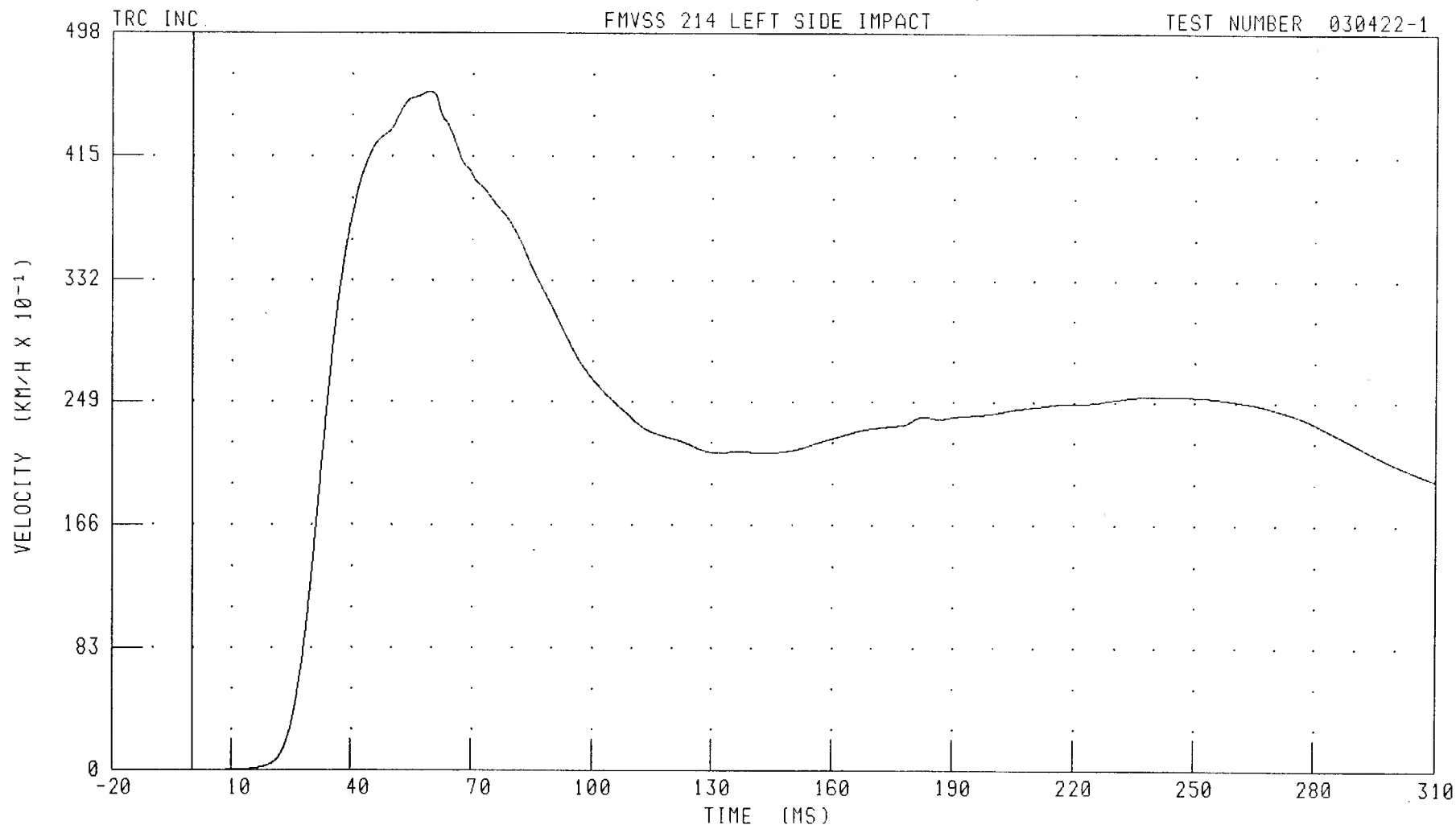
B-66

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
DRIVER LOWER SPINE Y-AXIS REDUNDANT VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL: T12YVI FILTER: CH CLASS 180

PEAK DATA: 45.82 KM/H @ 59.44 MS; 0 00 KM/H @ 0 00 MS

B-67

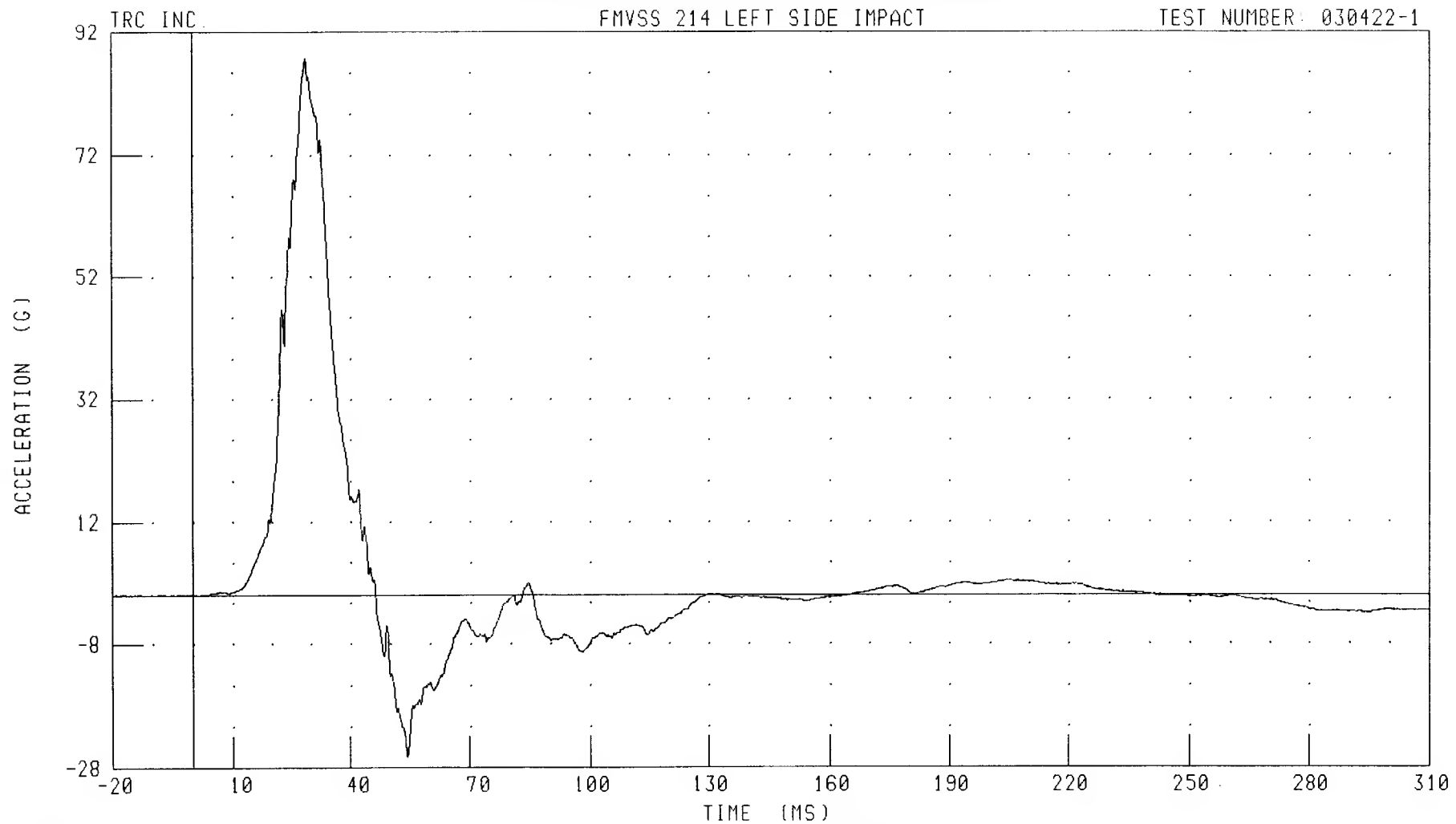
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

DRIVER PELVIS Y-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



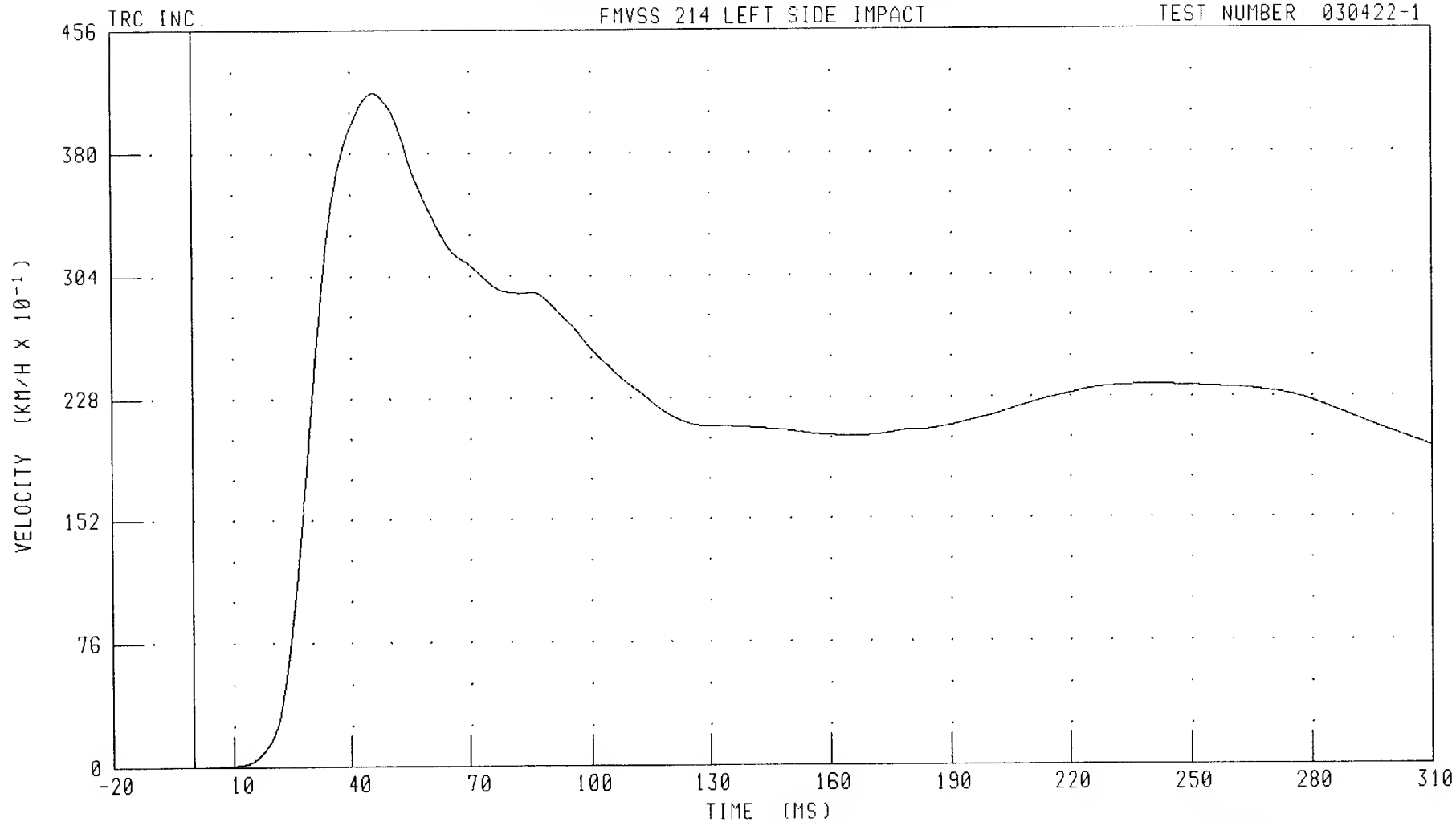
B-68

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
DRIVER PELVIS Y-AXIS REDUNDANT VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: PEVYVI

FILTER: CH. CLASS 180

PEAK DATA: 41 75 KM/H @ 46 24 MS, 0 00 KM/H @ 0 00 MS

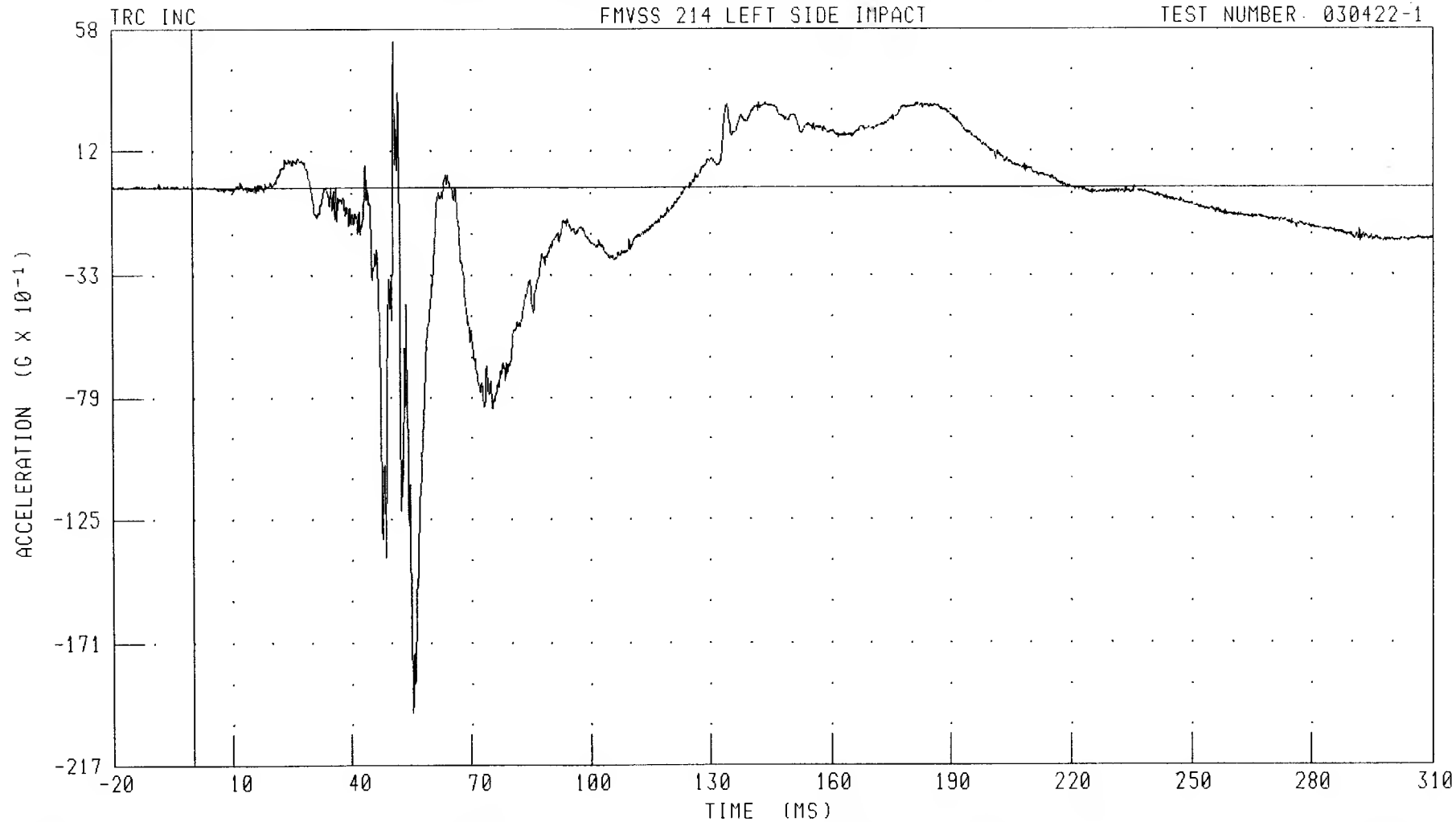
B-69

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT REAR PASSENGER HEAD X-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



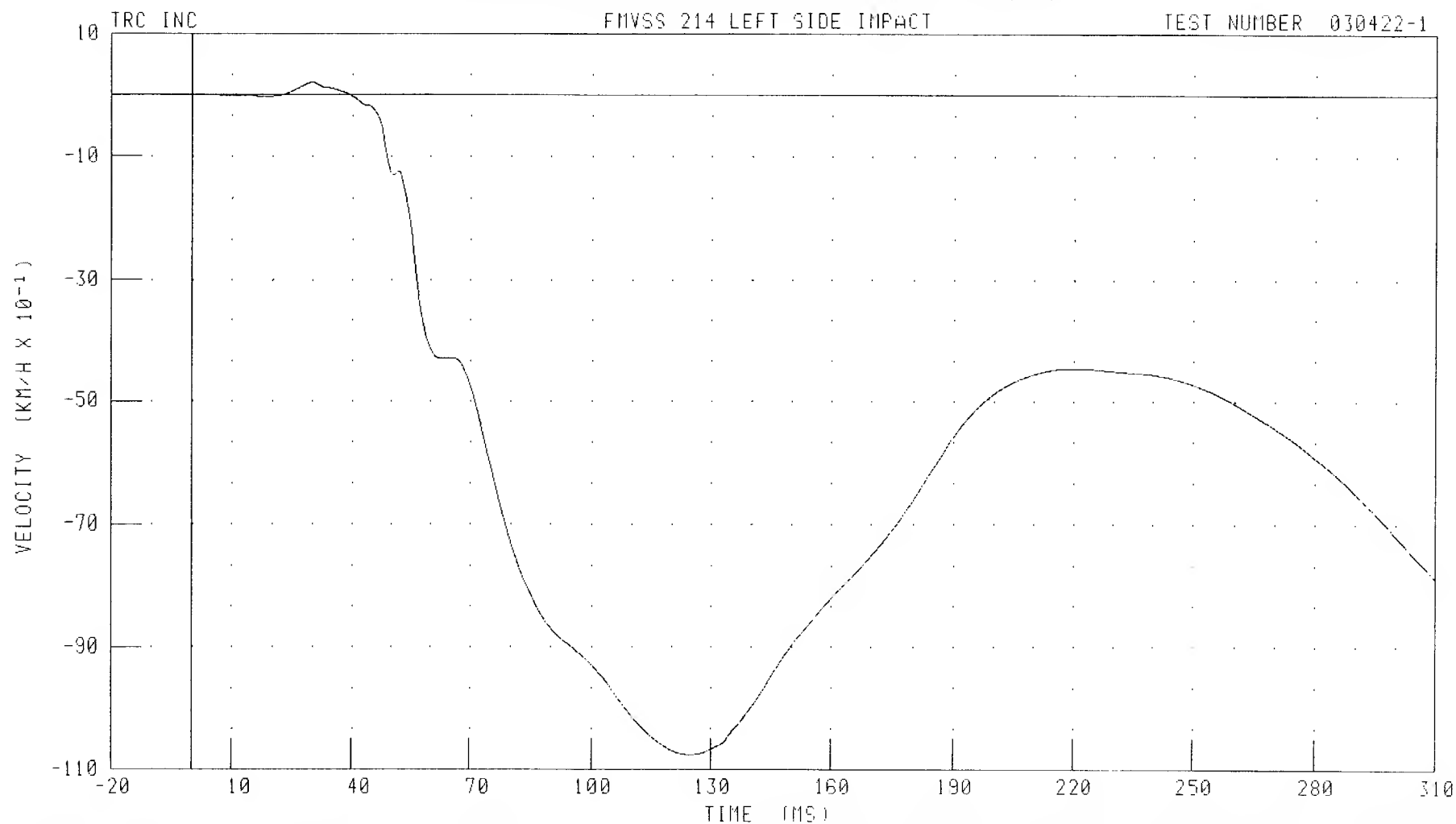
B-70

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT REAR PASSENGER HEAD X-AXIS REDUNDANT VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL - HEDXVJ FILTER - CH CLASS 180

PEAK DATA 0 21 KM/H @ 29 84 MS, -10 76 KM/H @ 124 64 MS

B-71

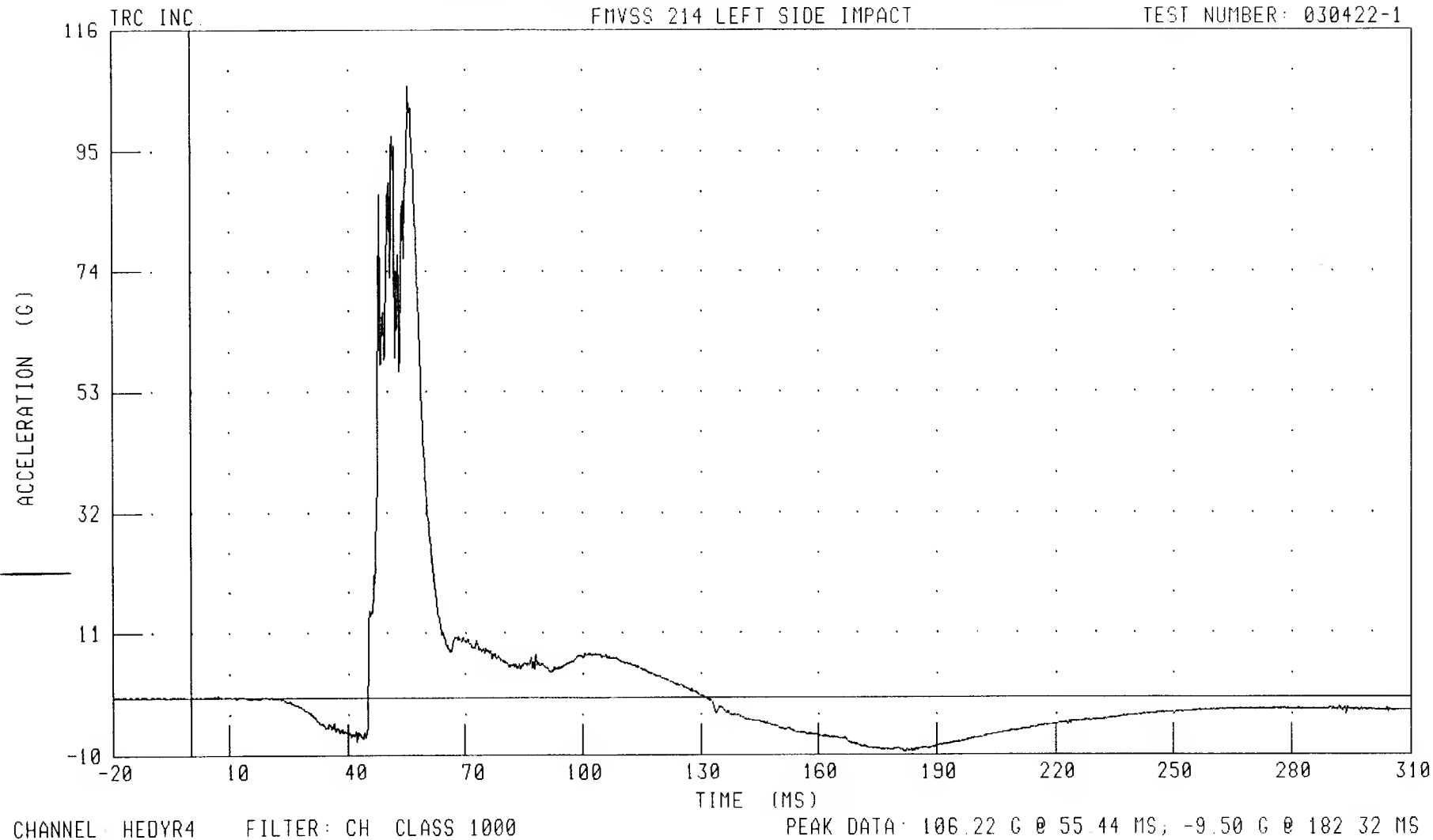
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

LEFT REAR PASSENGER HEAD Y-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



B-72

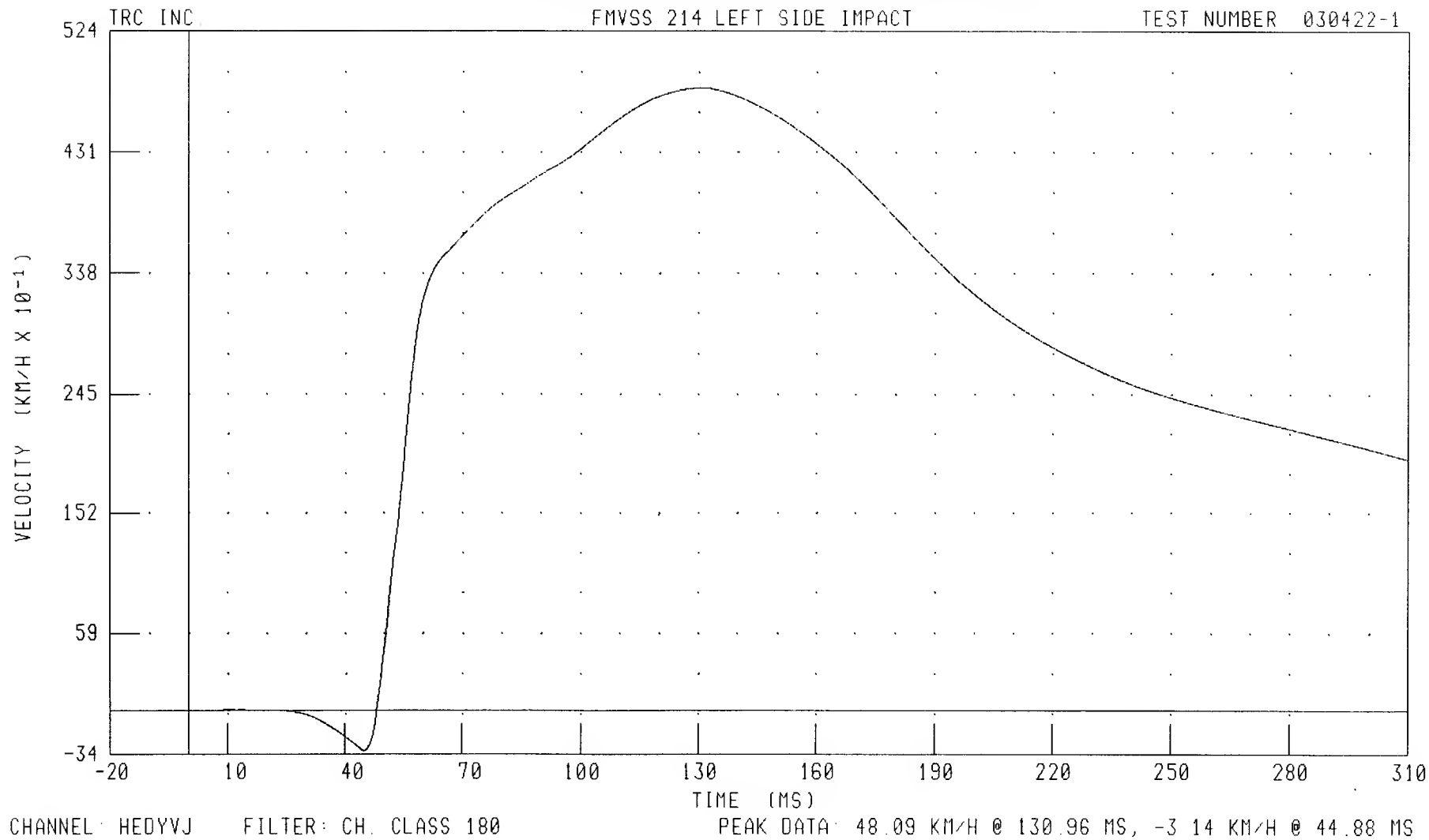
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

LEFT REAR PASSENGER HEAD Y-AXIS REDUNDANT VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



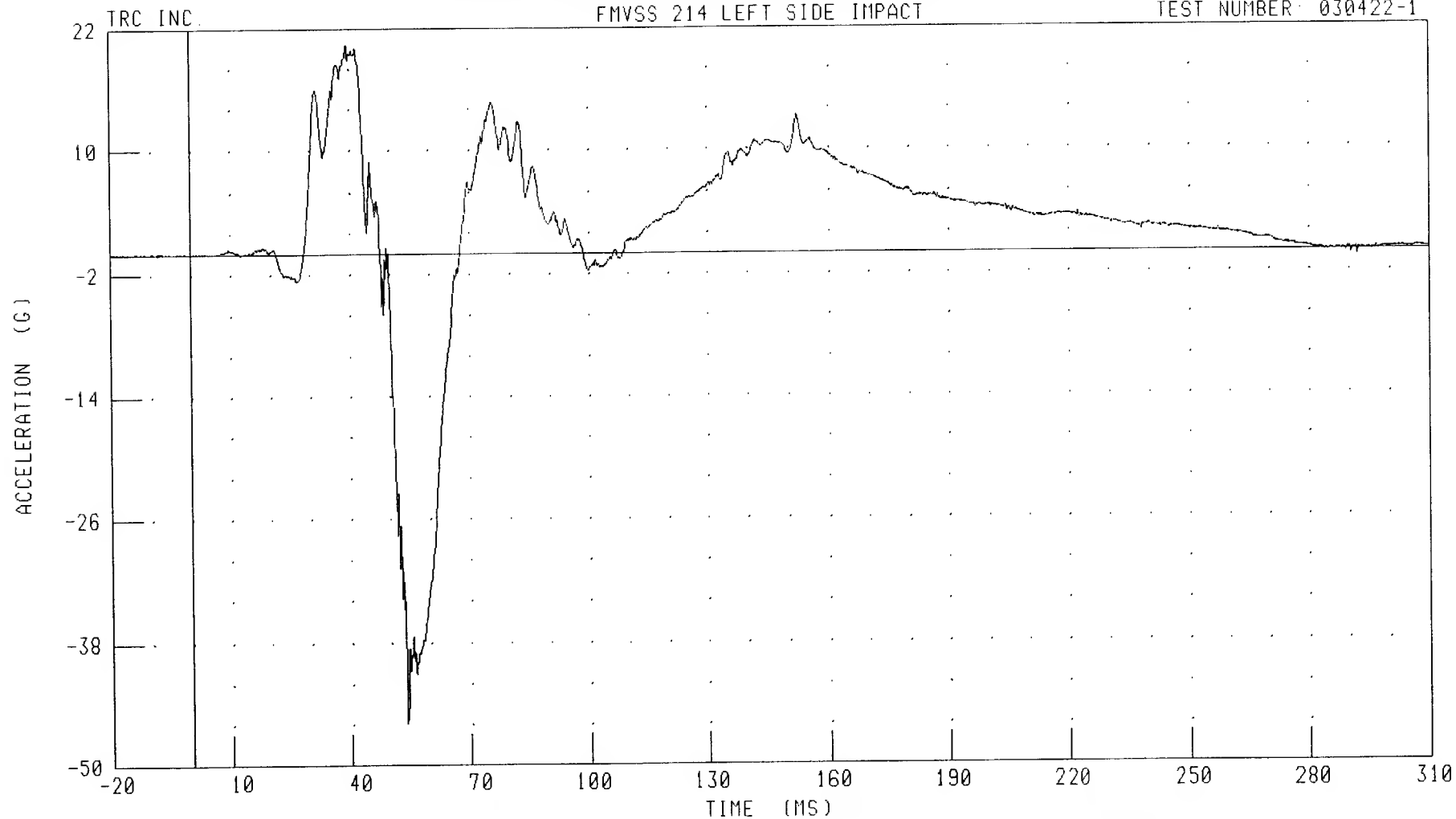
B-73

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT REAR PASSENGER HEAD Z-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: HEDZR4 FILTER: CH. CLASS 1000

PEAK DATA: 20.41 G @ 39.60 MS; -45.90 G @ 53.92 MS

B-74

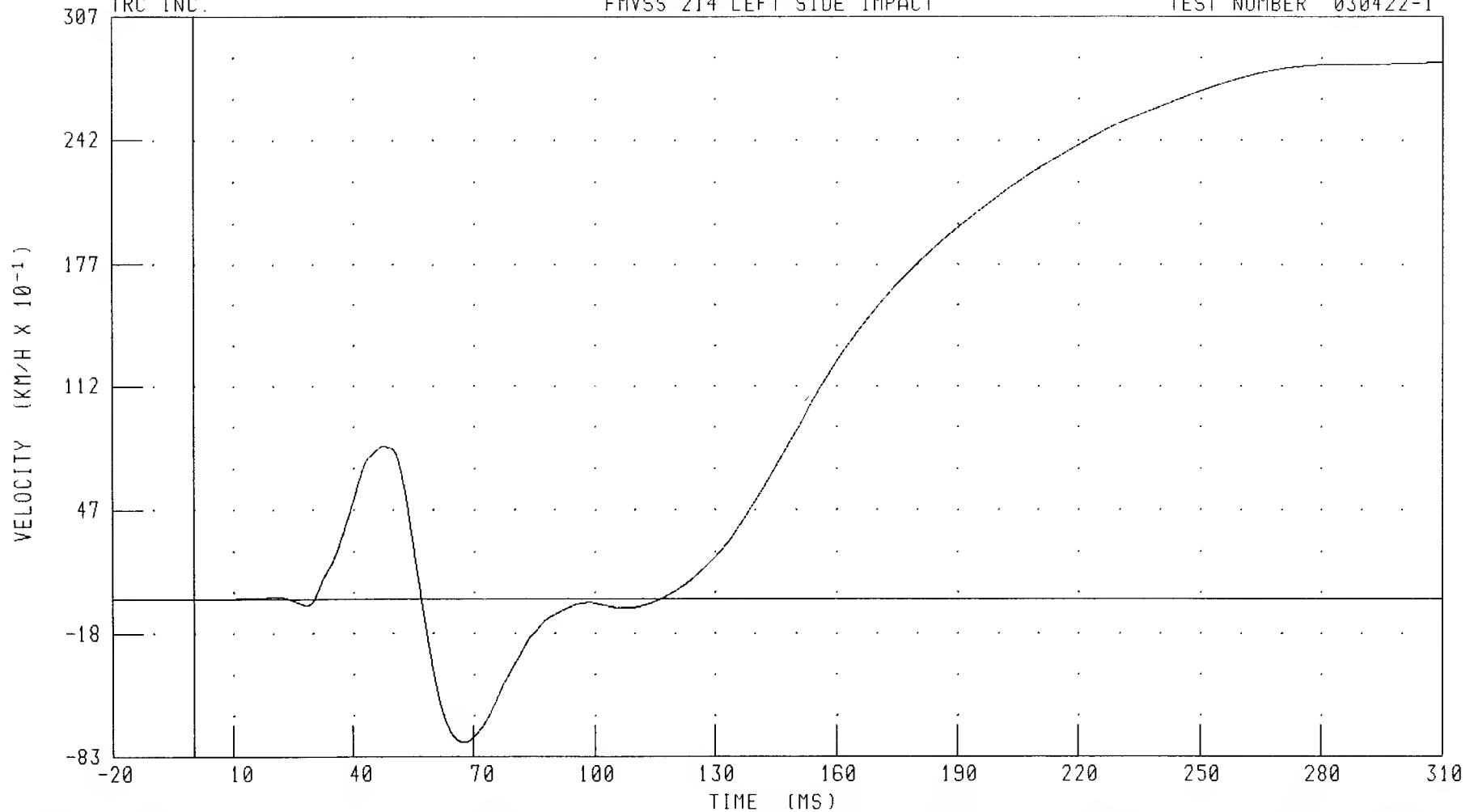
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT REAR PASSENGER HEAD Z-AXIS REDUNDANT VELOCITY

TRC INC.

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL: HEDZVJ FILTER: CH. CLASS 180

PEAK DATA: 28.30 KM/H @ 310.00 MS, -7.56 KM/H @ 67.76 MS

B-75

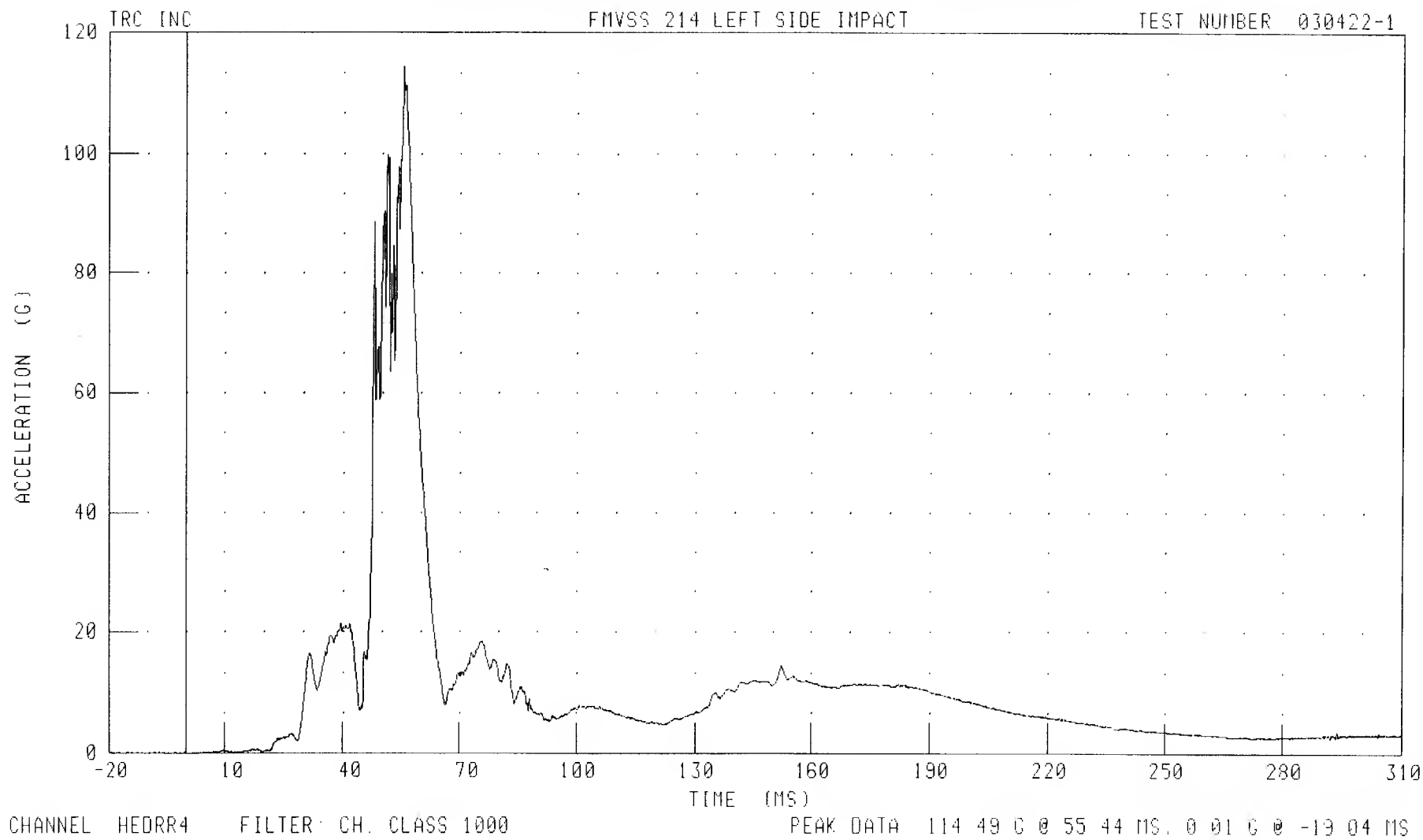
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

LEFT REAR PASSENGER HEAD RESULTANT REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



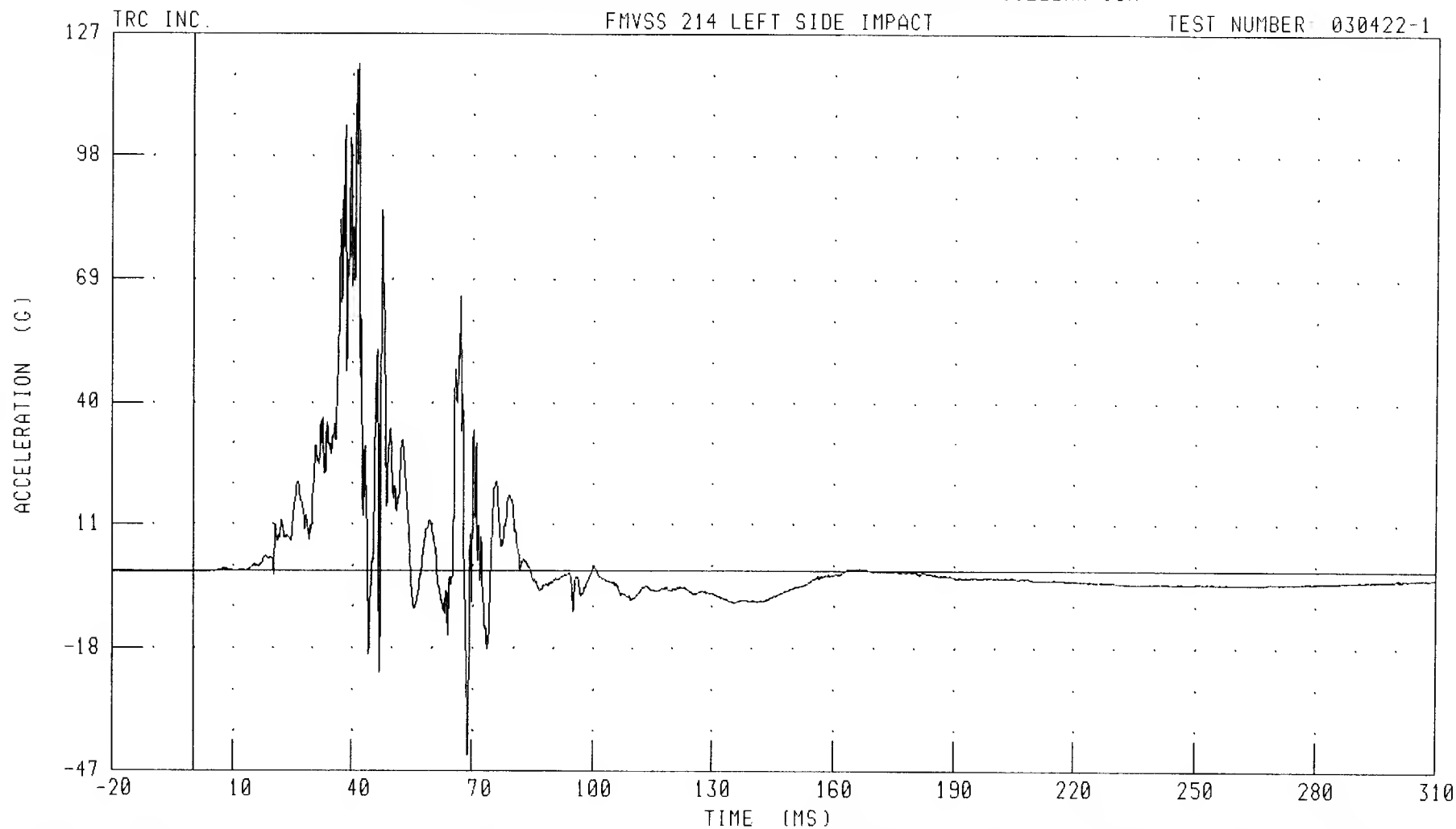
B-76

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT REAR PASSENGER UPPER RIB Y-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: LURYR4

FILTER: CH. CLASS 1000

PEAK DATA: 120.04 G @ 41.68 MS, -43.22 G @ 68.96 MS

B-77

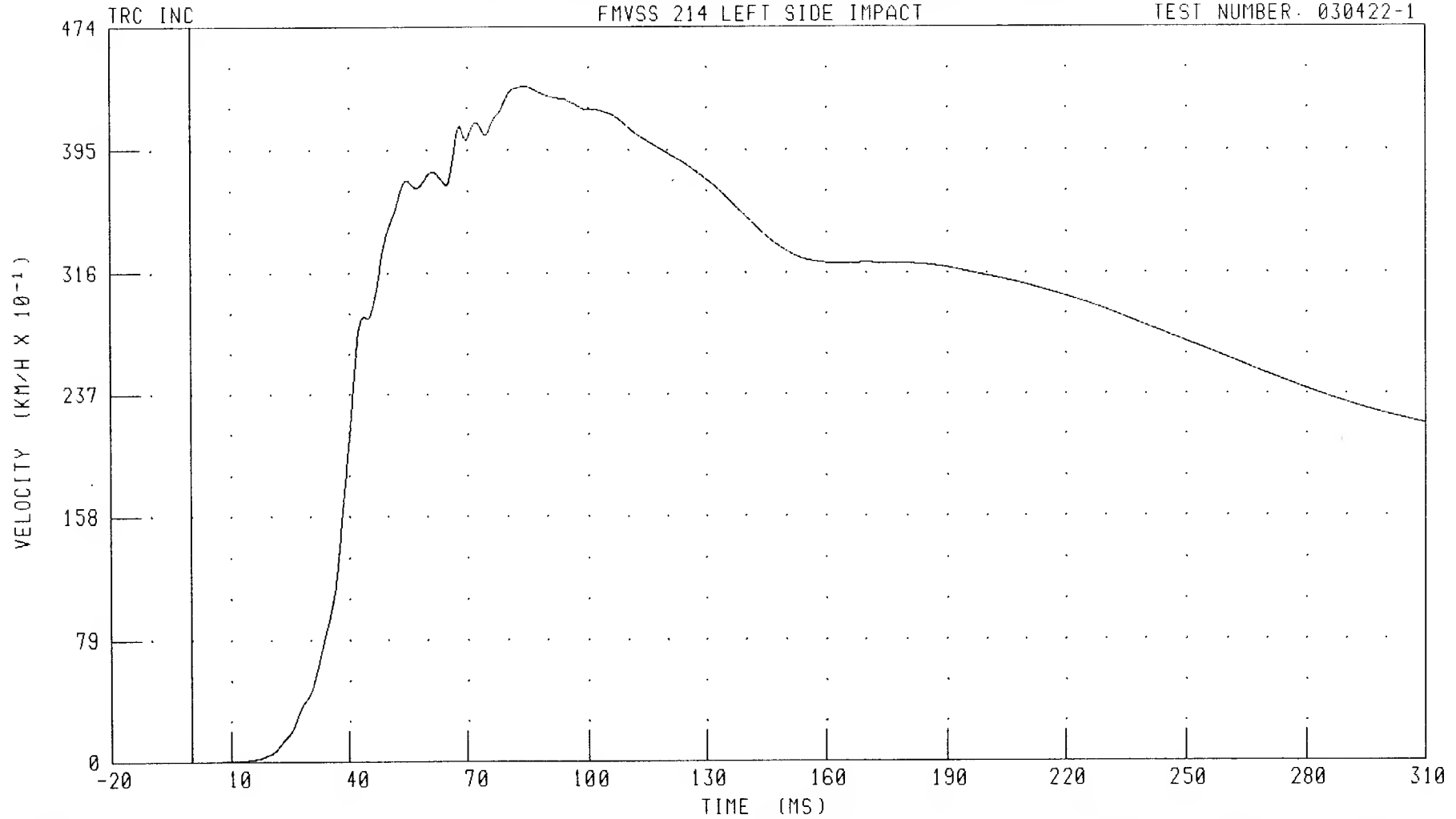
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

LEFT REAR PASSENGER UPPER RIB Y-AXIS REDUNDANT VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: LURYVJ FILTER: CH. CLASS 180

PEAK DATA: 43 54 KM/H @ 84.32 MS; 0.00 KM/H @ 0 00 MS

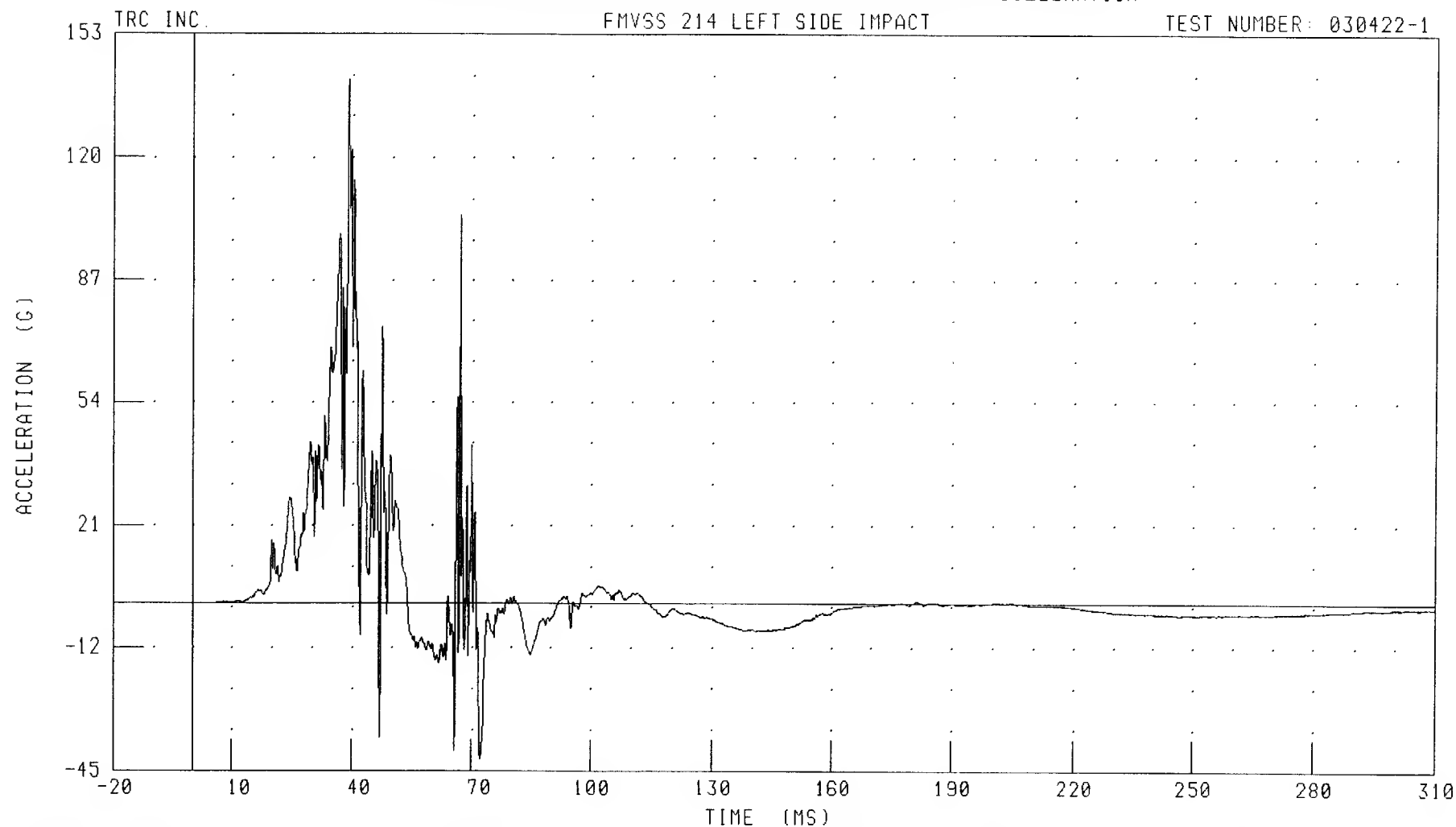
B-78

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT REAR PASSENGER LOWER RIB Y-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: LLRYR4 FILTER: CH CLASS 1000

PEAK DATA: 141.08 G @ 39.04 MS; -41.69 G @ 72.16 MS

B-79

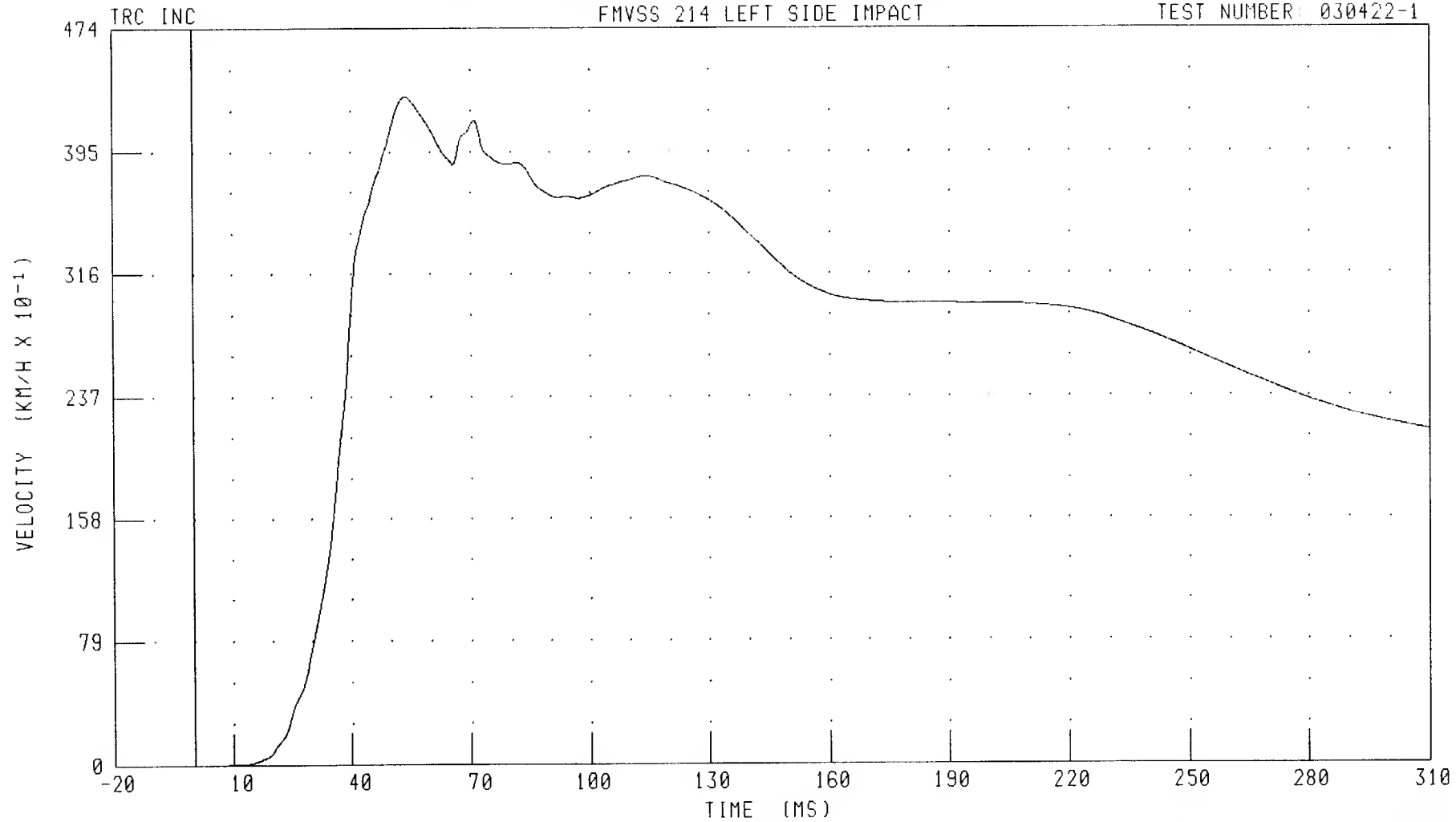
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

LEFT REAR PASSENGER LOWER RIB Y-AXIS REDUNDANT VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: LLRYVJ

FILTER: CH. CLASS 180

PEAK DATA 43.09 KM/H @ 53.92 MS; 0 00 KM/H @ 0 00 MS

B-80

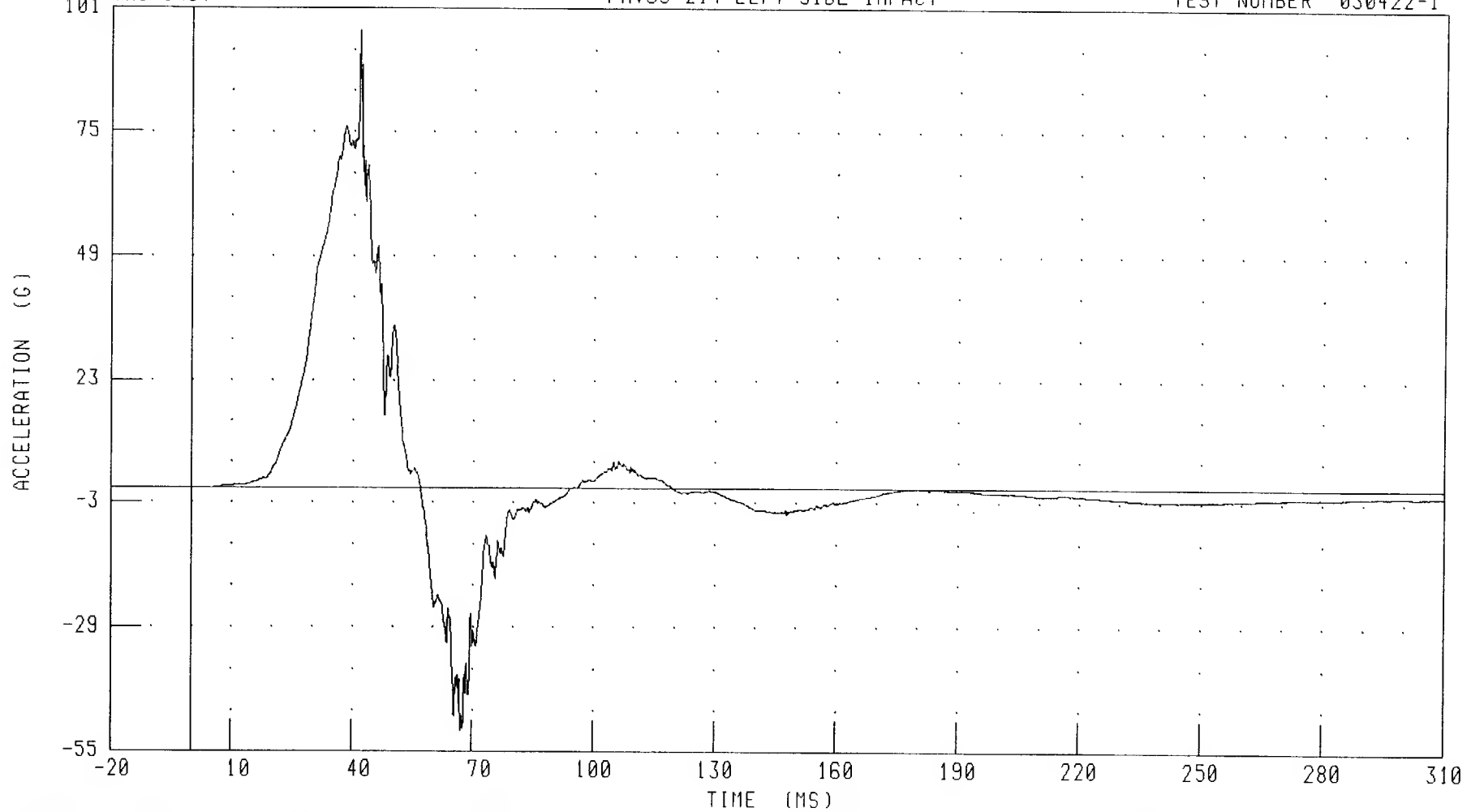
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT REAR PASSENGER LOWER SPINE Y-AXIS REDUNDANT ACCELERATION

TRC INC.

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL: T12YR4 FILTER: CH. CLASS 1000

PEAK DATA: 96.33 G @ 41.68 MS; -50.59 G @ 67.04 MS

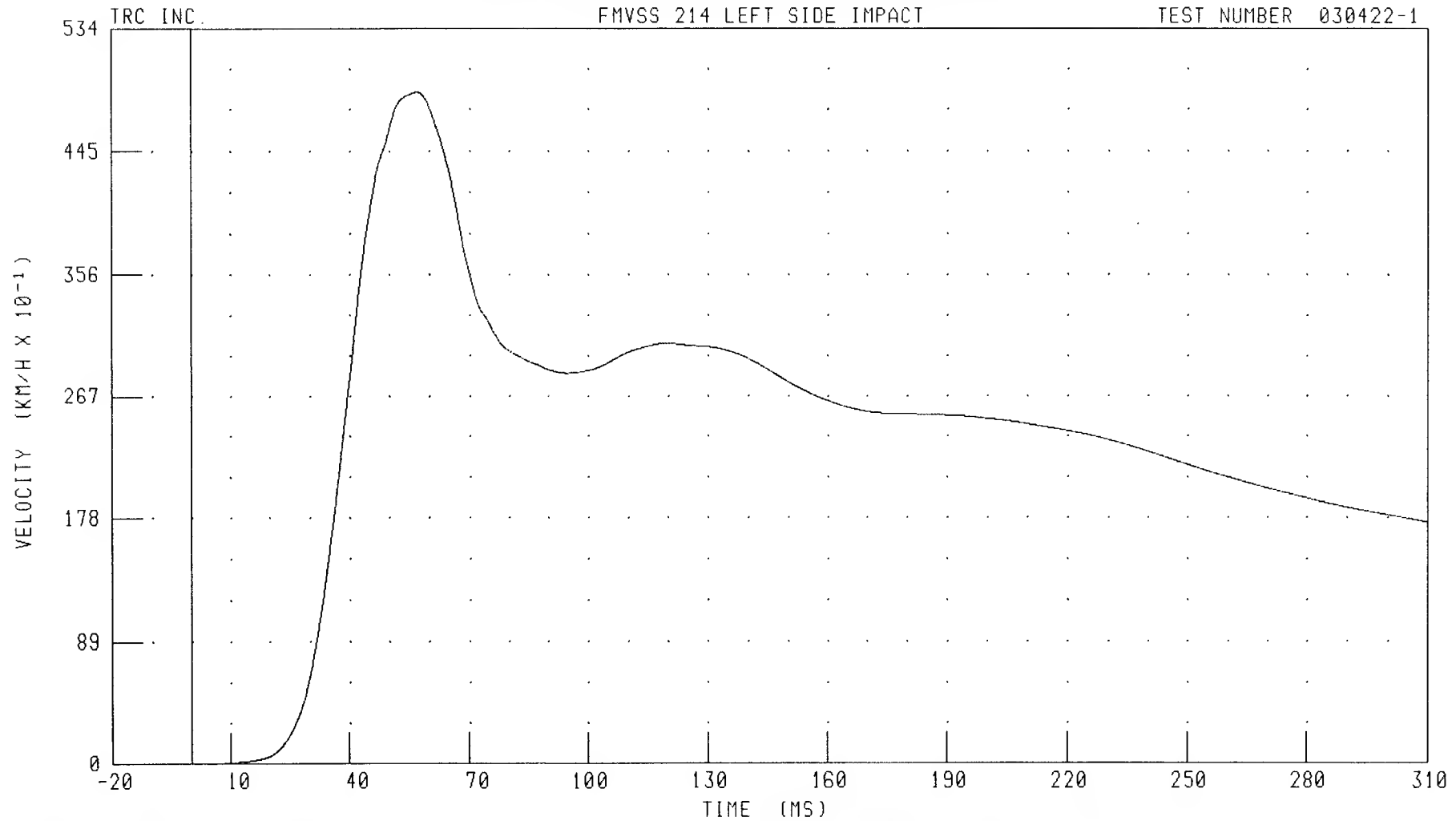
B-81

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT REAR PASSENGER LOWER SPINE Y-AXIS REDUNDANT VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL: T12YVJ FILTER: CH CLASS 180

PEAK DATA 48.73 KM/H @ 56.88 MS, 0.00 KM/H @ 0.00 MS

B-82

030422-1

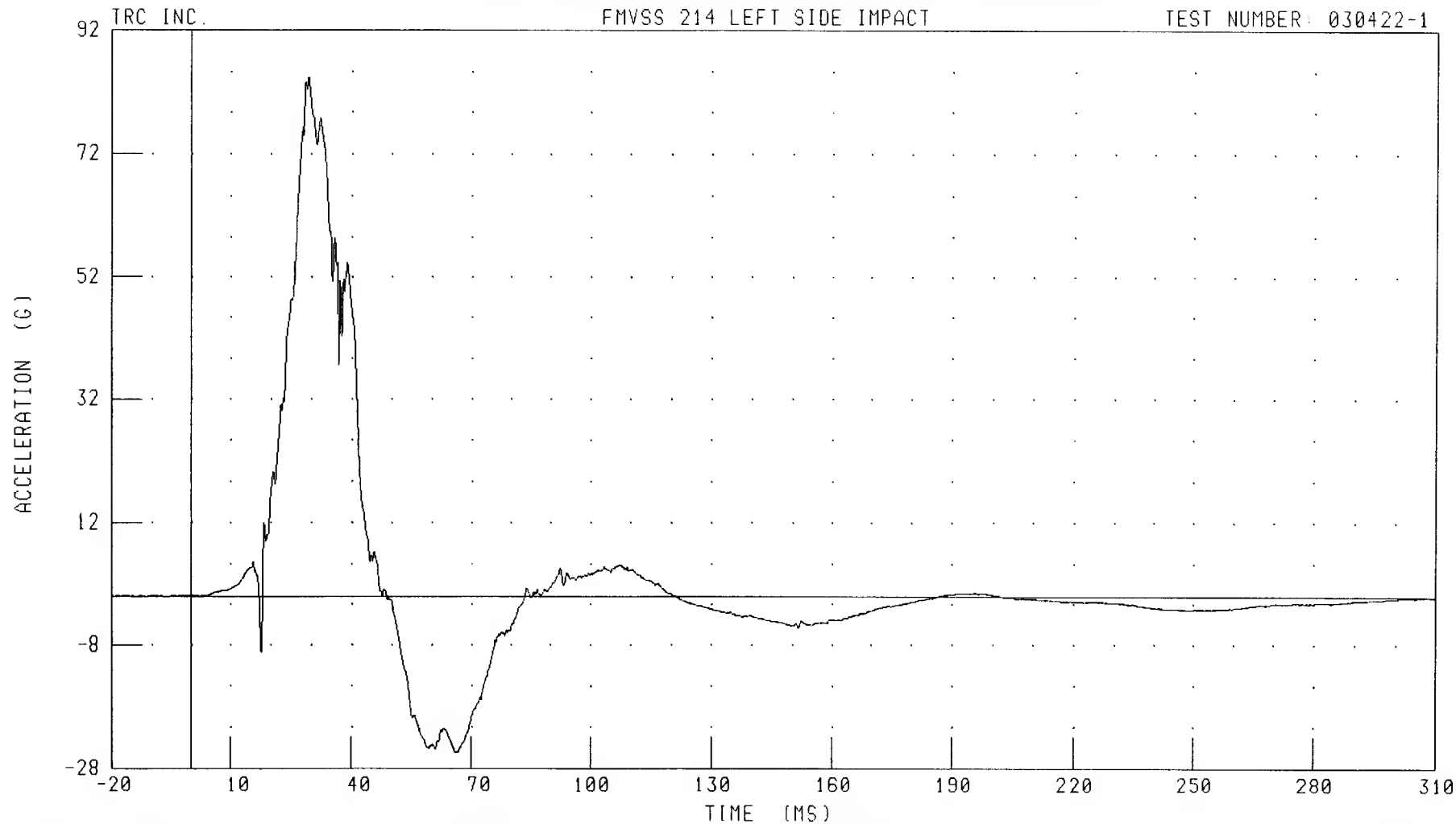
55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

LEFT REAR PASSENGER PELVIS Y-AXIS REDUNDANT ACCELERATION

TRC INC.

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



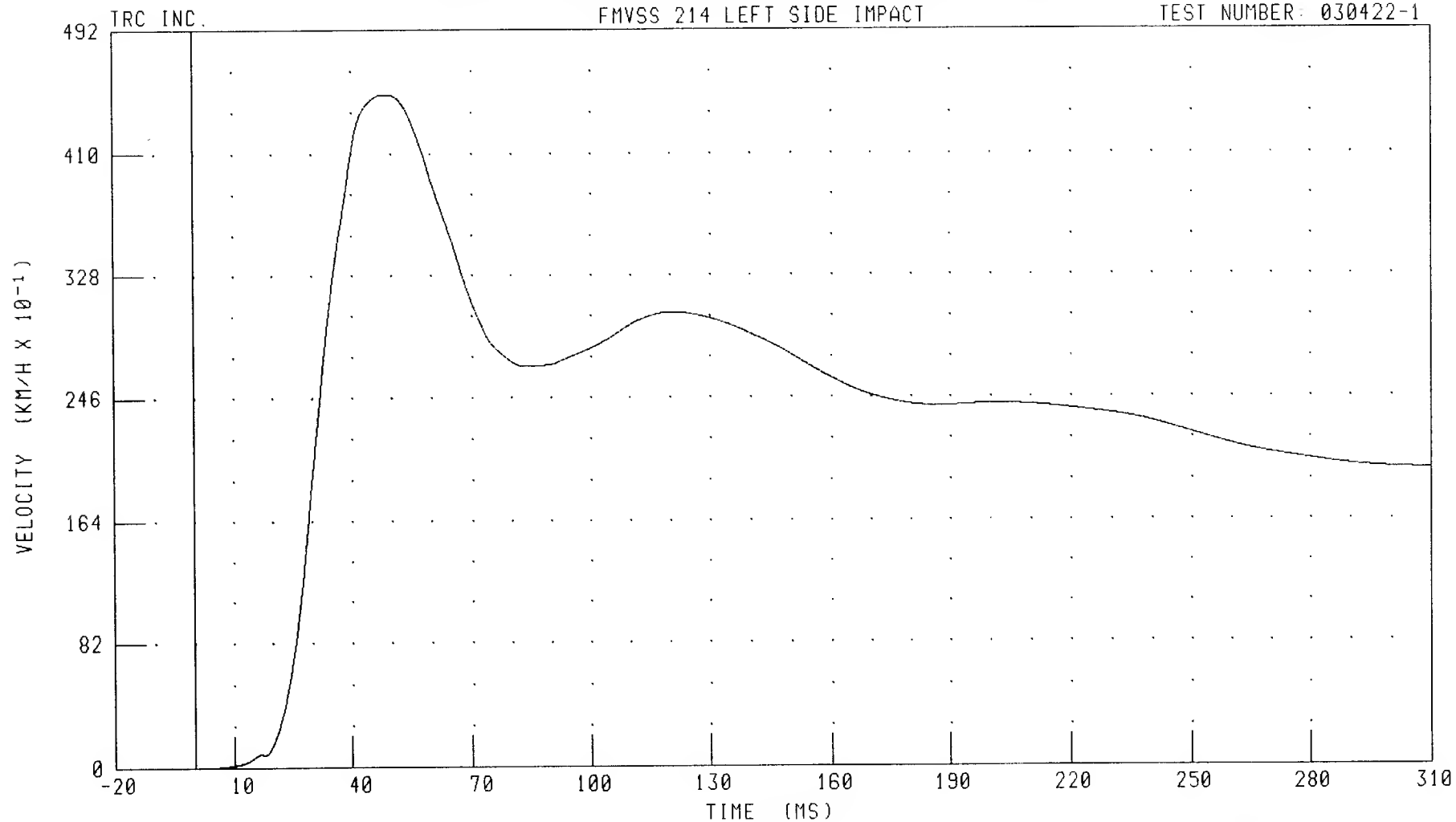
CHANNEL: PEVYR4 FILTER: CH. CLASS 1000

PEAK DATA: 84.44 G @ 29.36 MS; -25.51 G @ 66.00 MS

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT REAR PASSENGER PELVIS Y-AXIS REDUNDANT VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: PEVYVJ

FILTER: CH. CLASS 180

PEAK DATA: 44.93 KM/H @ 48.88 MS; 0.00 KM/H @ 0.00 MS

B-84

030422-1

Test Vehicle Instrumentation Plots

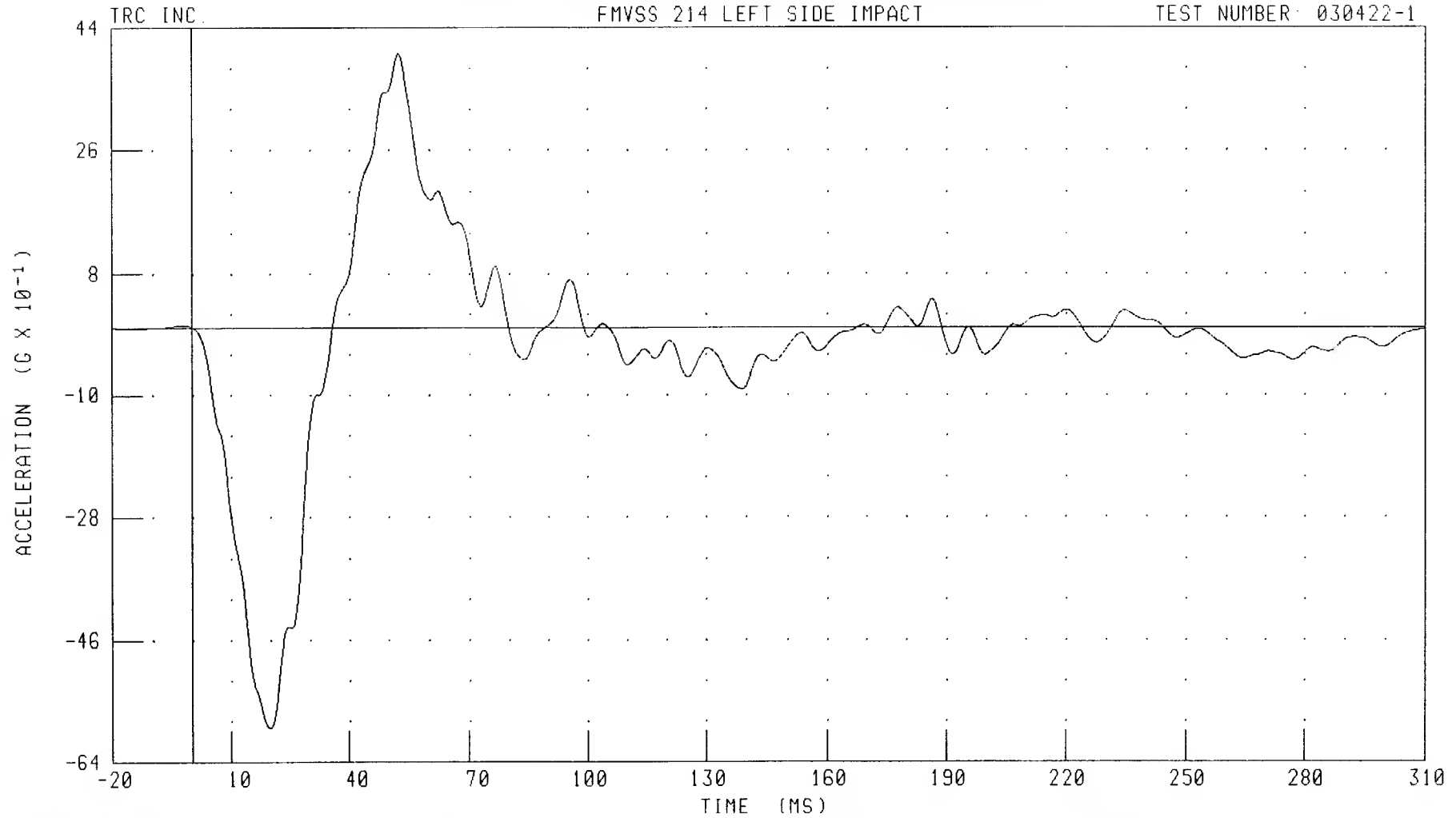
Acceleration Data - Filter Class 60

Integration Data - Filter Class 180

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
RIGHT SIDE SILL AT FRONT SEAT X-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: RFSXG1 FILTER: CH. CLASS 60

PEAK DATA: 4.02 G @ 52.48 MS; -5.91 G @ 20.00 MS

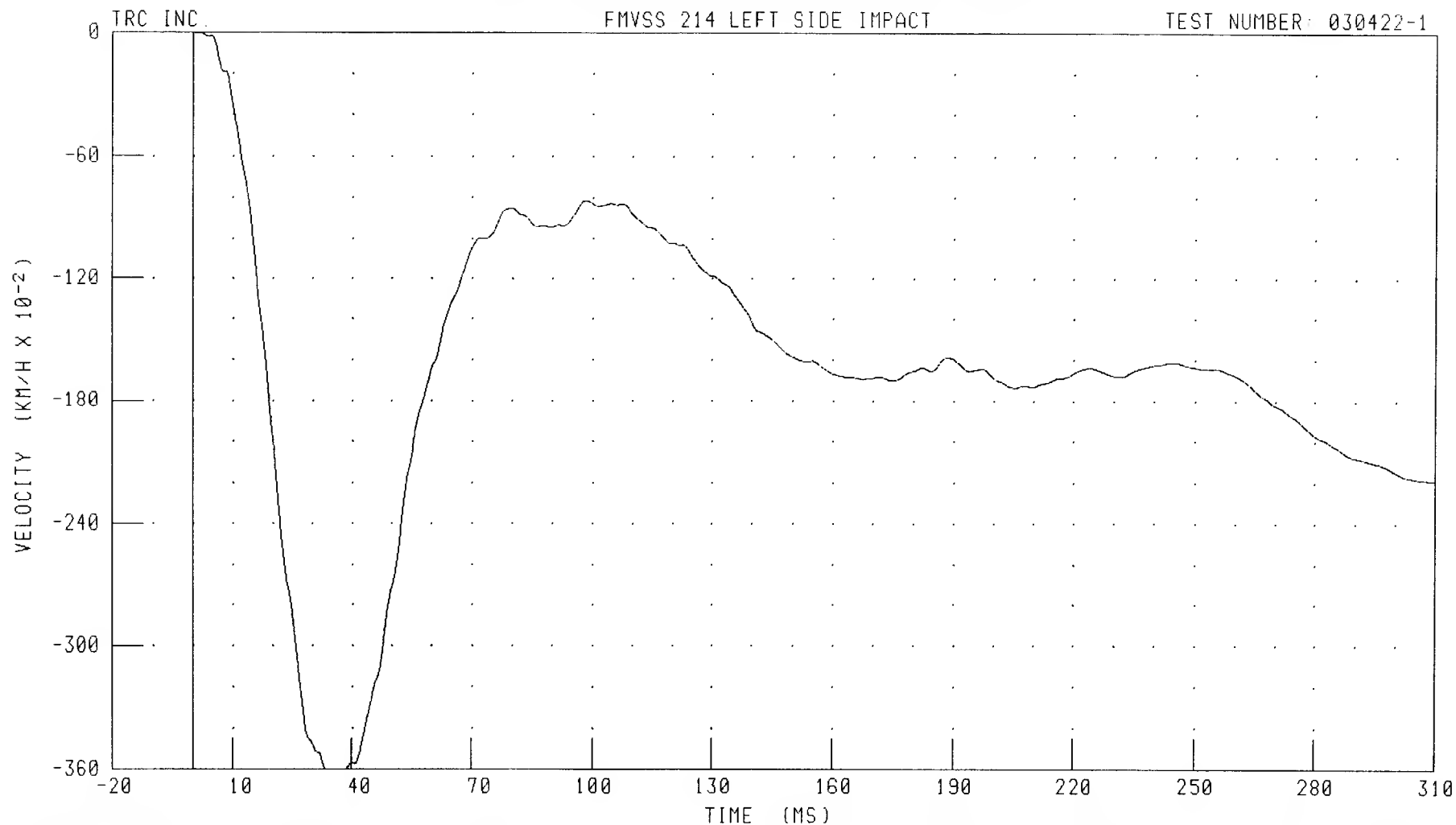
B-86

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
RIGHT SIDE SILL AT FRONT SEAT X-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: RFSXV1

FILTER: CH. CLASS 180

PEAK DATA: 0 00 KM/H @ 0 00 MS; -3.67 KM/H @ 35 60 MS

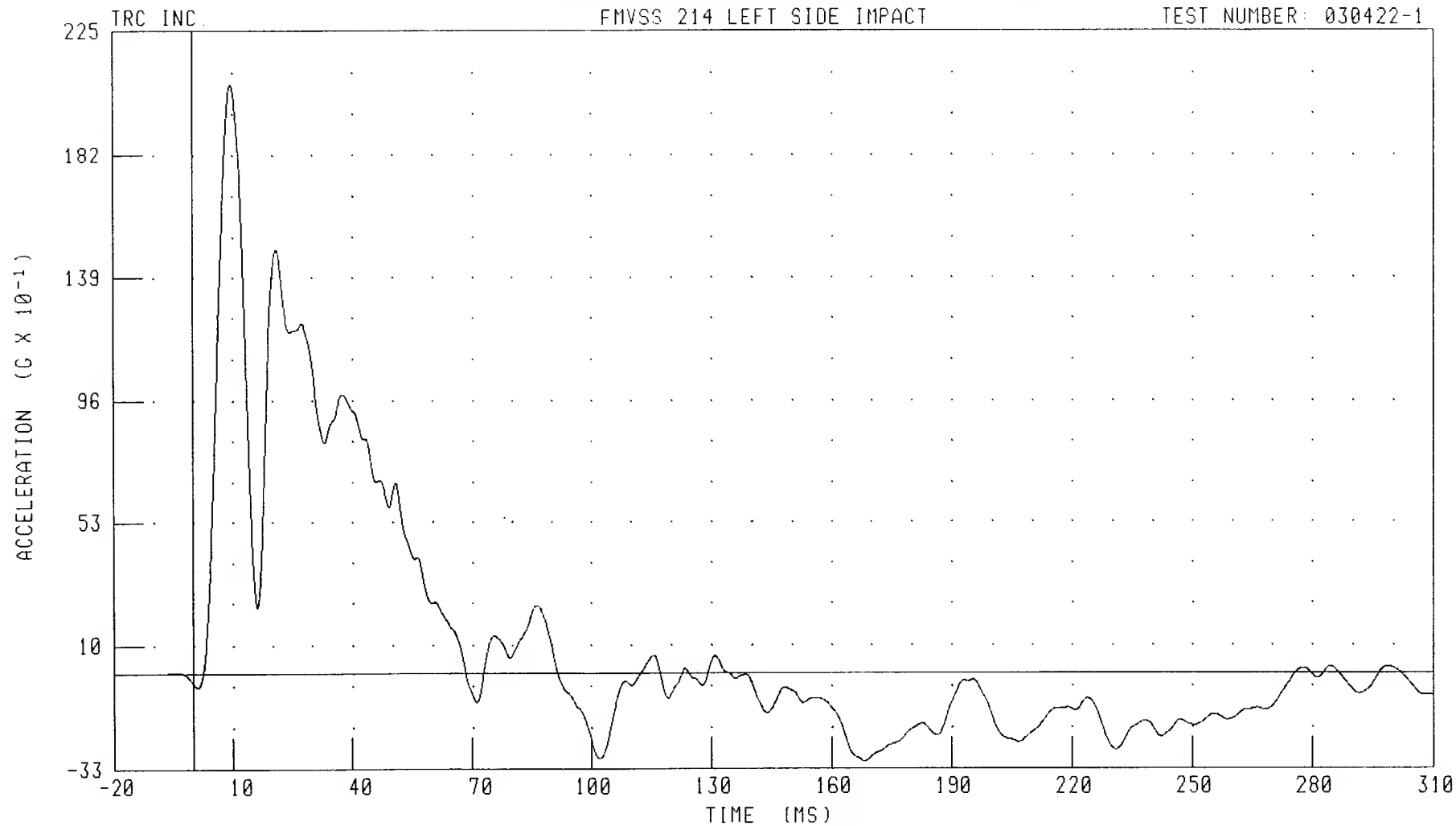
B-87

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
RIGHT SIDE SILL AT FRONT SEAT Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



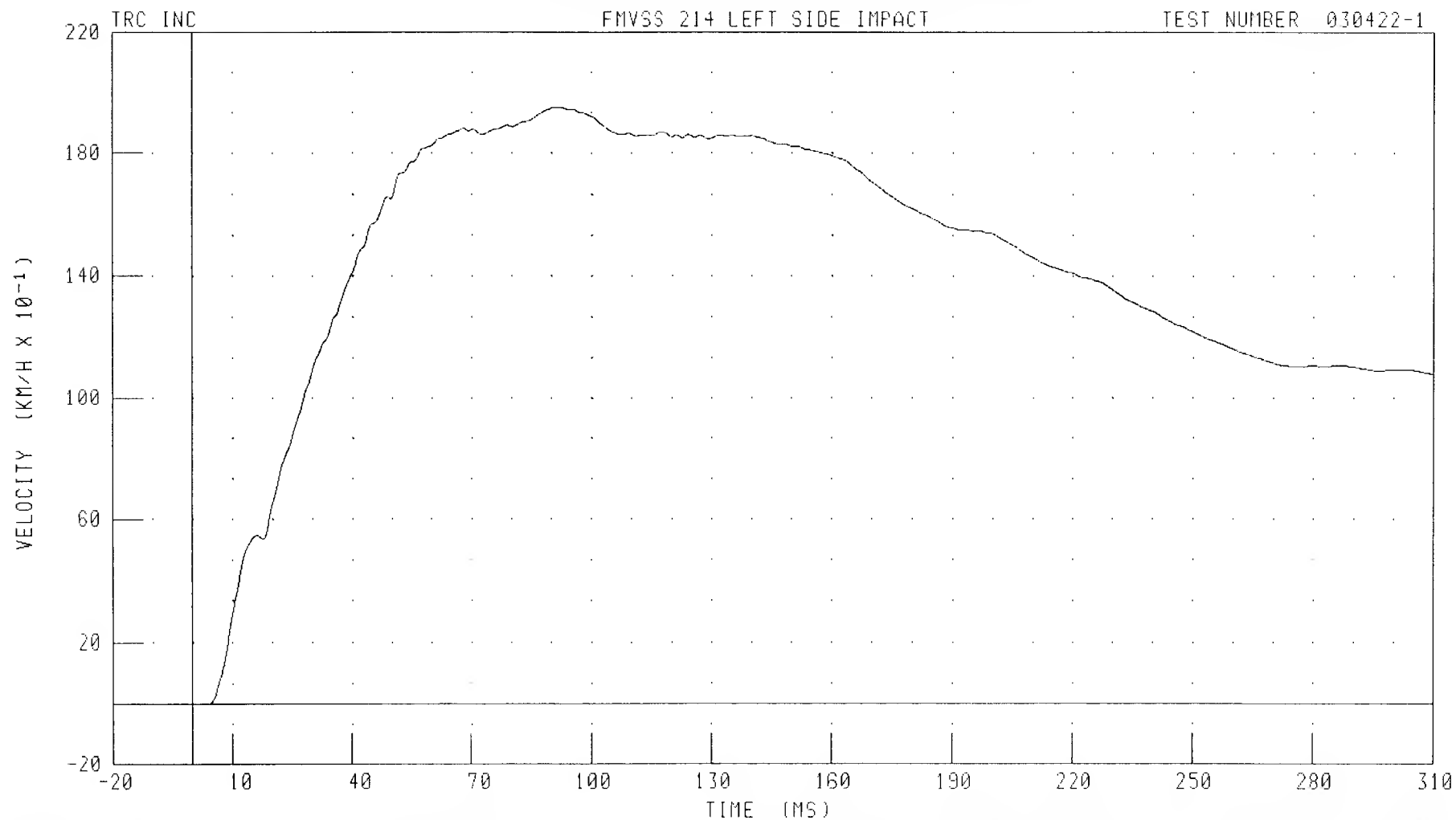
B-88

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
RIGHT SIDE SILL AT FRONT SEAT Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL RFSYV1 FILTER CH CLASS 180

PEAK DATA 19 51 KM/H @ 90 72 MS, -0 01 KM/H @ 4 08 MS

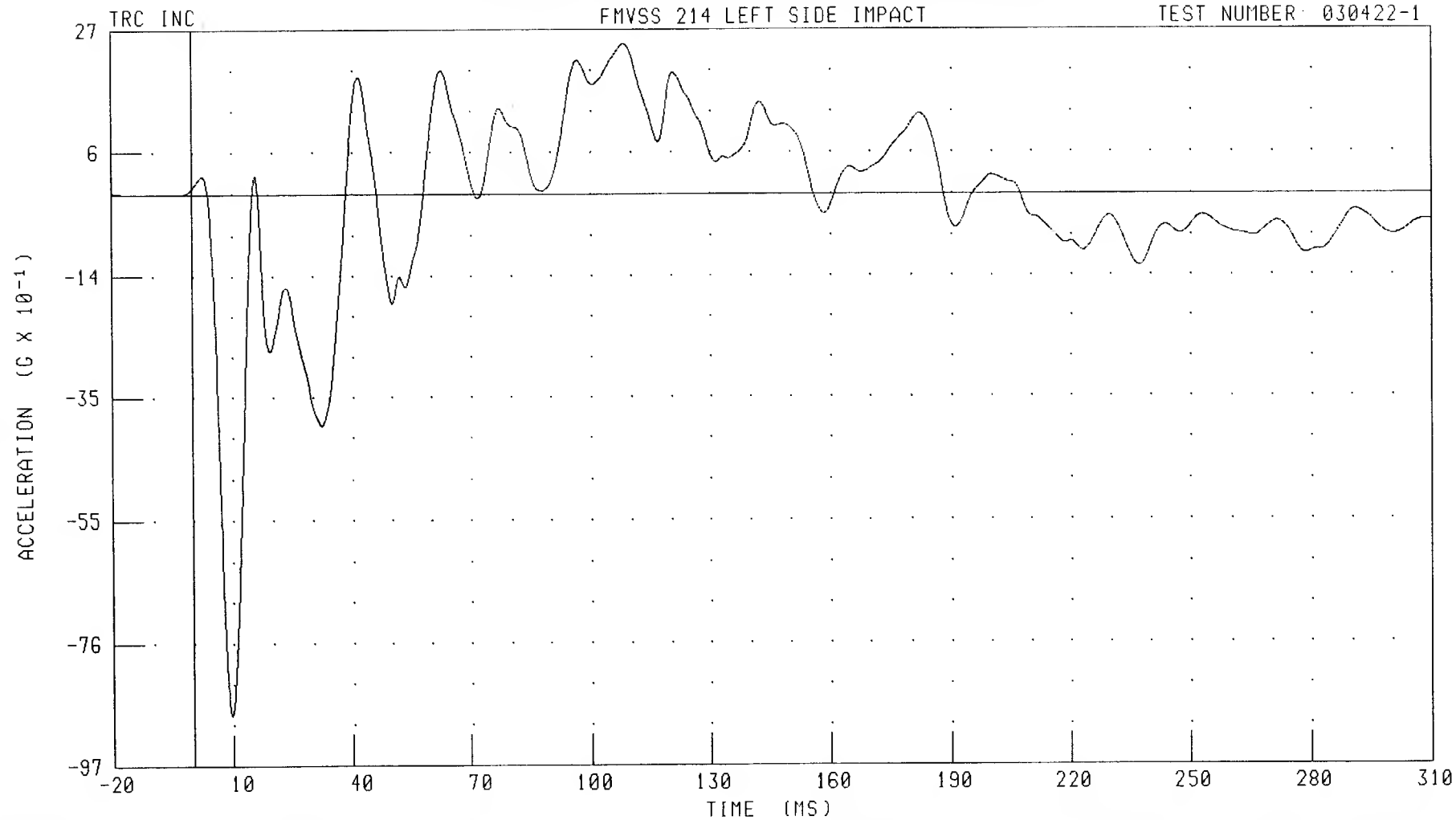
B-89

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
RIGHT SIDE SILL AT FRONT SEAT Z-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: RFSZG1 FILTER: CH CLASS 60

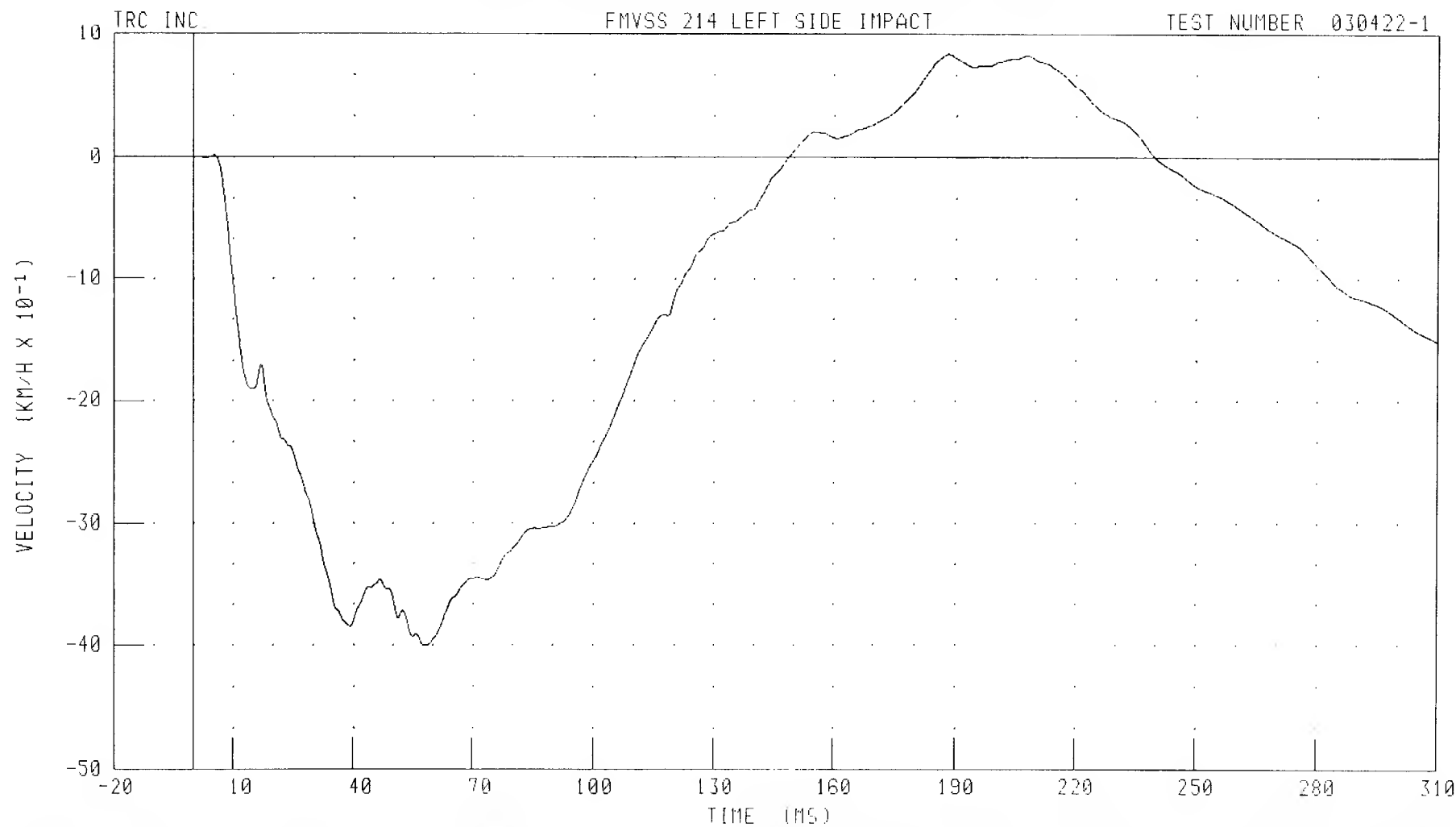
B-90

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
RIGHT SIDE SILL AT FRONT SEAT Z-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL RFSZV1 FILTER CH CLASS 100

PEAK DATA 0 84 KM/H @ 183 08 MS, -4 01 KM/H @ 57 76 MS

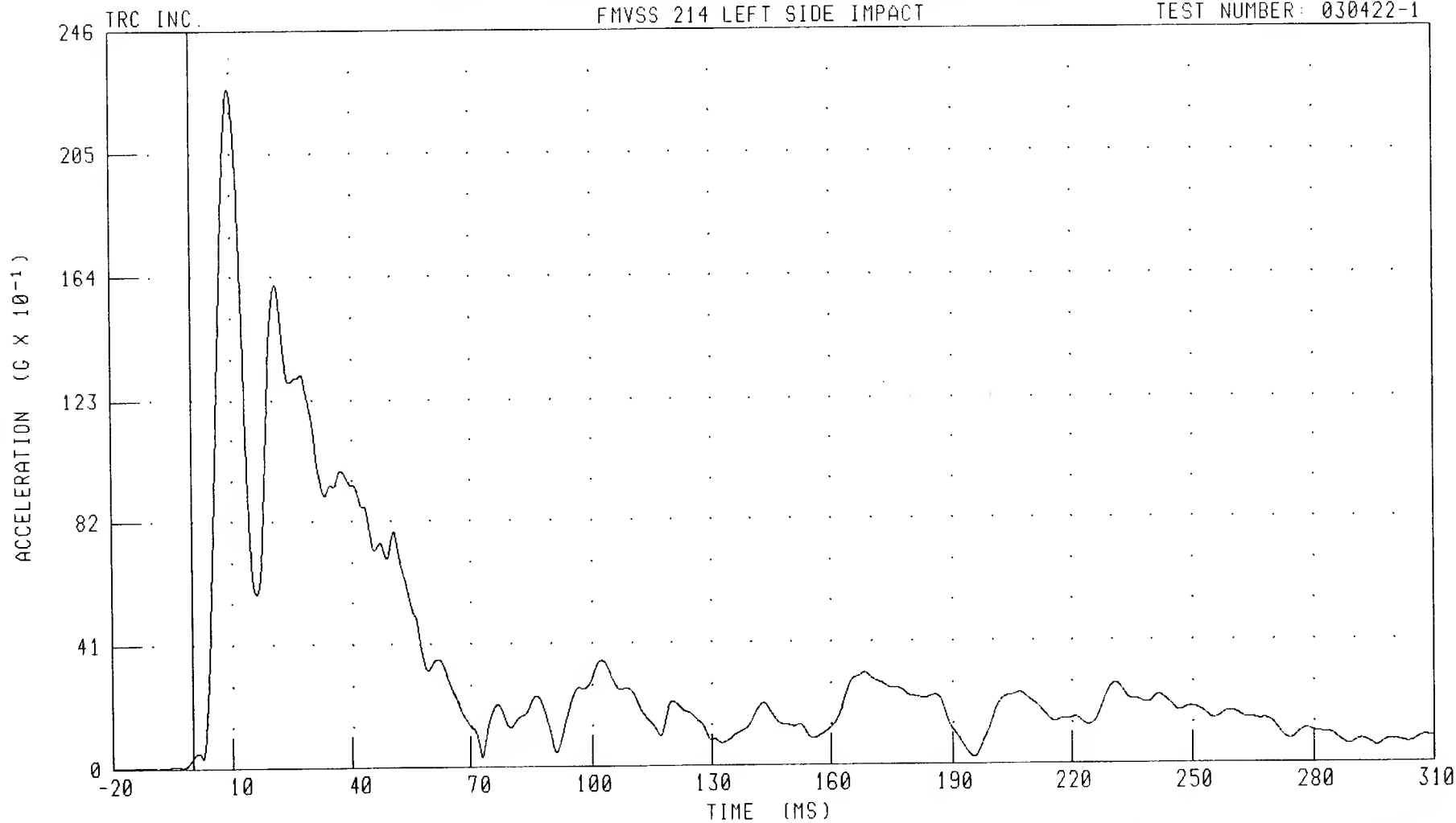
B-91

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
RIGHT SIDE SILL AT FRONT SEAT RESULTANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: RFSRG1 FILTER: CH. CLASS 60

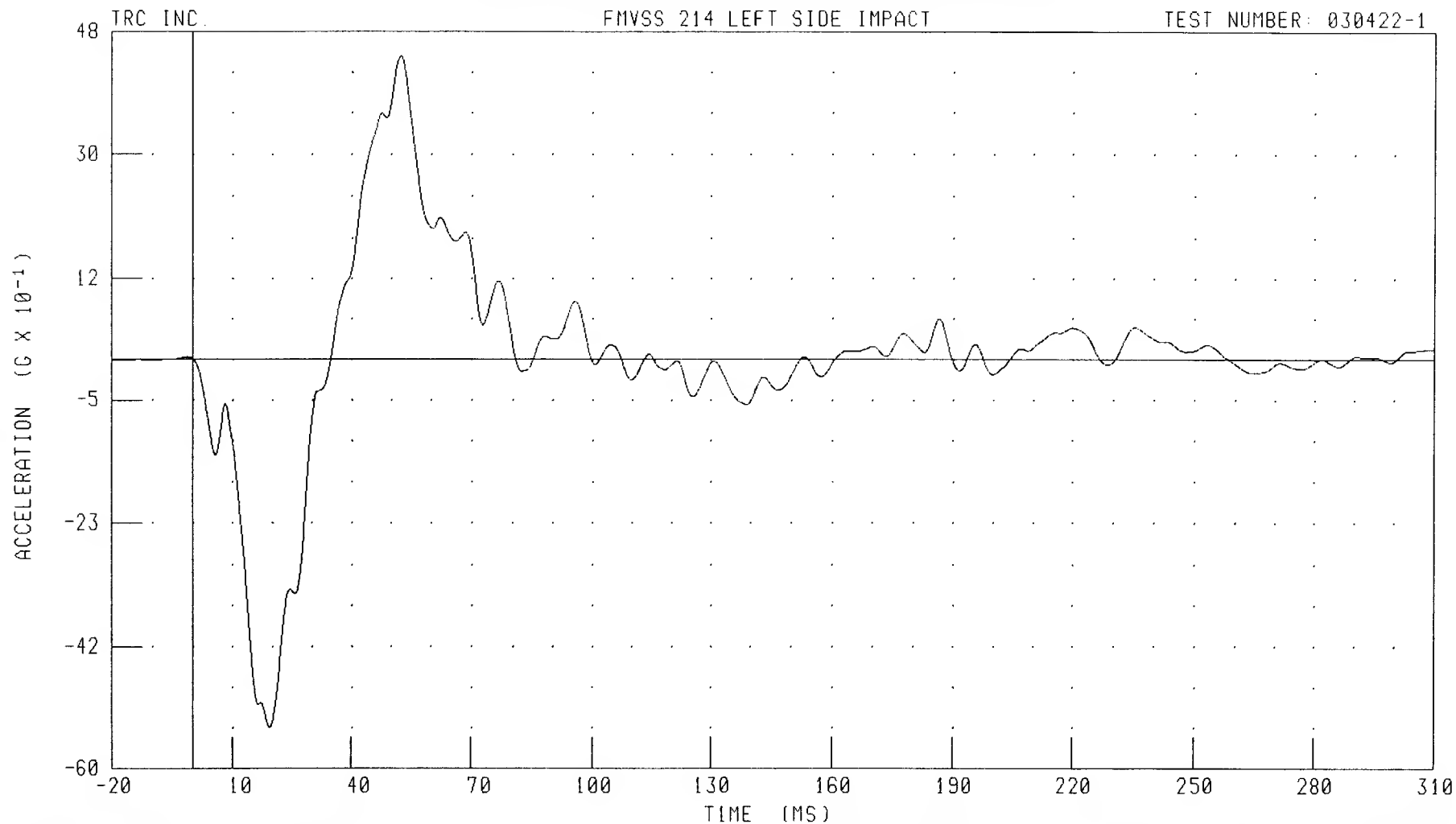
B-92

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
RIGHT SIDE SILL AT REAR SEAT X-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



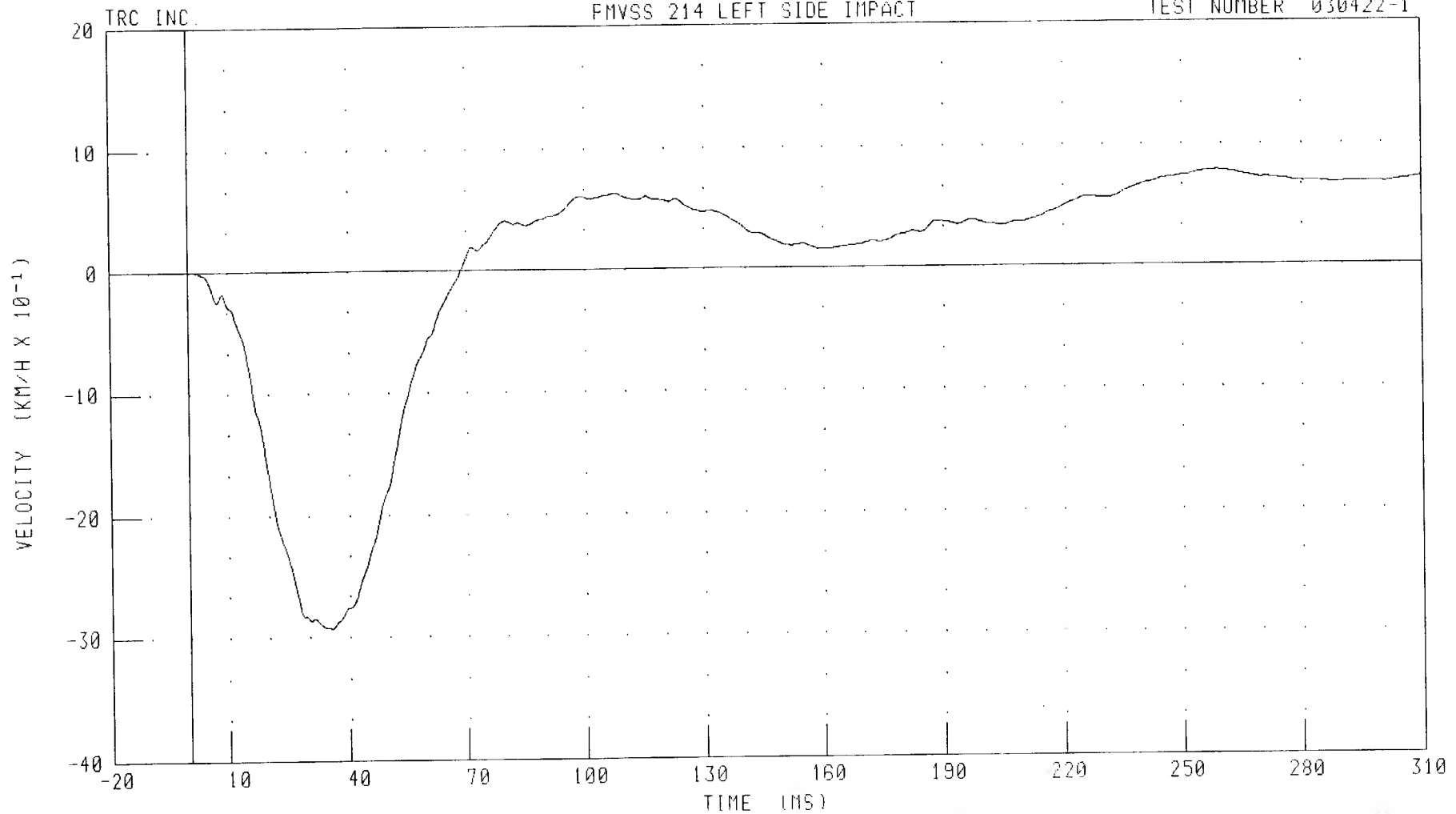
CHANNEL: RRSXG1 FILTER: CH. CLASS 60

PEAK DATA: 4.44 G @ 52.48 MS; -5.40 G @ 19.28 MS

B-93

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
RIGHT SIDE SILL AT REAR SEAT X-AXIS VELOCITY
FMVSS 214 LEFT SIDE IMPACT TEST NUMBER 030422-1



CHANNEL RRSXV1 FILTER CH CLASS 100

PEAK DATA 0 79 KM/H @ 259 04 MS, -2 93 KM/H @ 35 60 MS

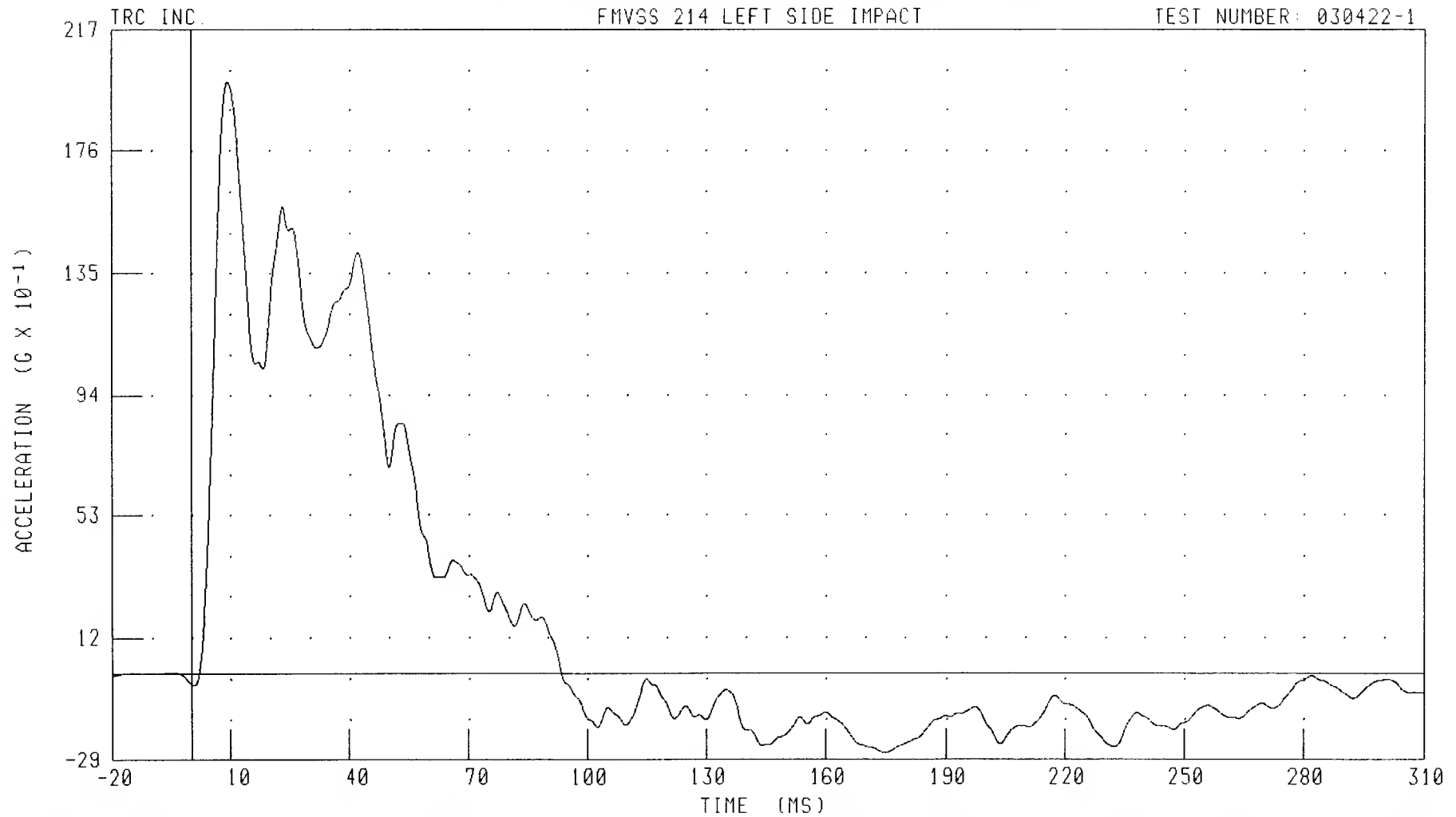
B-94

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
RIGHT SIDE SILL AT REAR SEAT Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: RRSYG1 FILTER: CH. CLASS 60

PEAK DATA 19.93 G @ 9.28 MS; -2.66 G @ 175.28 MS

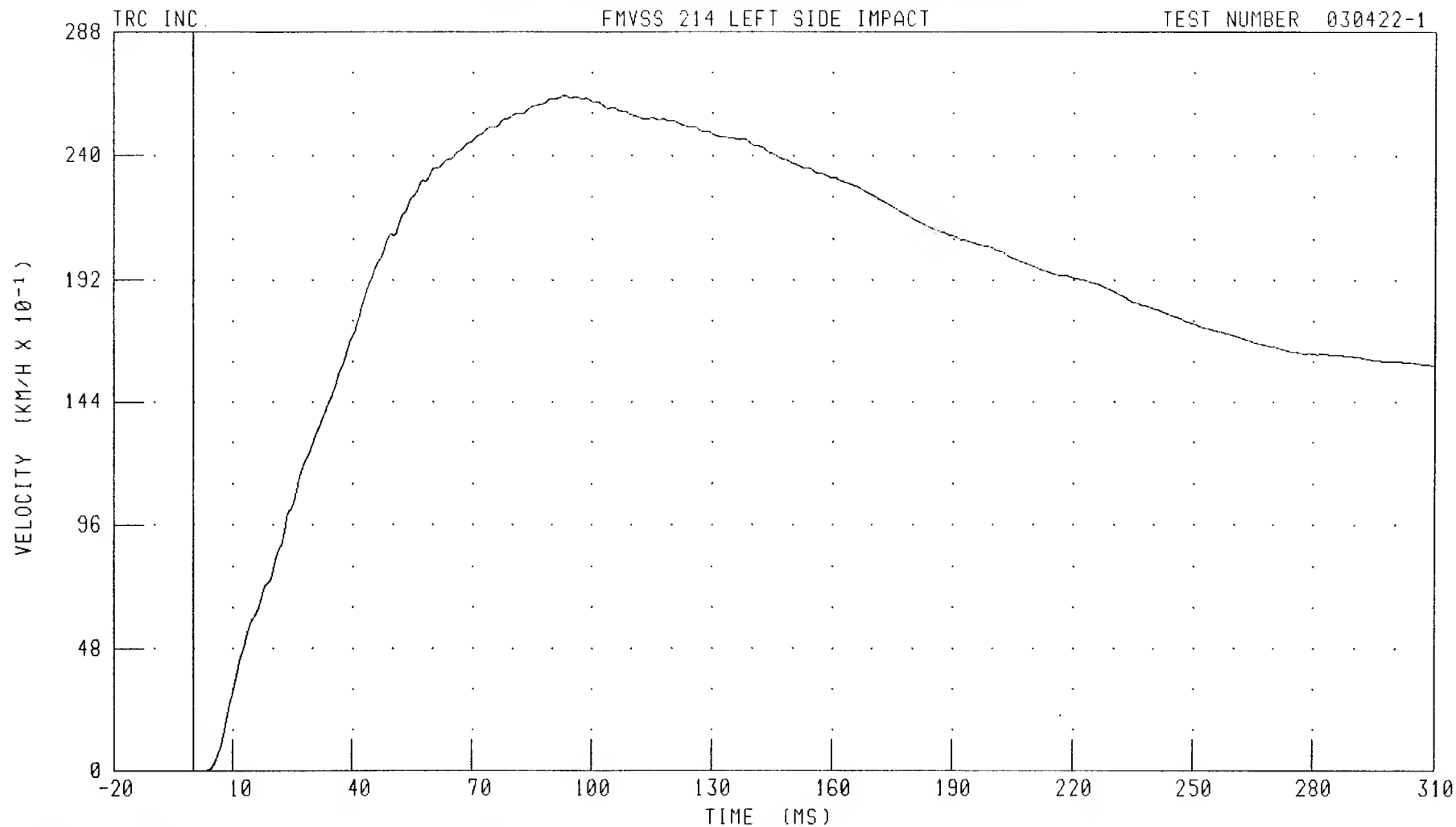
B-95

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
RIGHT SIDE SILL AT REAR SEAT Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL: RRSYV1 FILTER: CH. CLASS 180

PEAK DATA: 26.31 KM/H @ 93.12 MS; 0.00 KM/H @ 0.00 MS

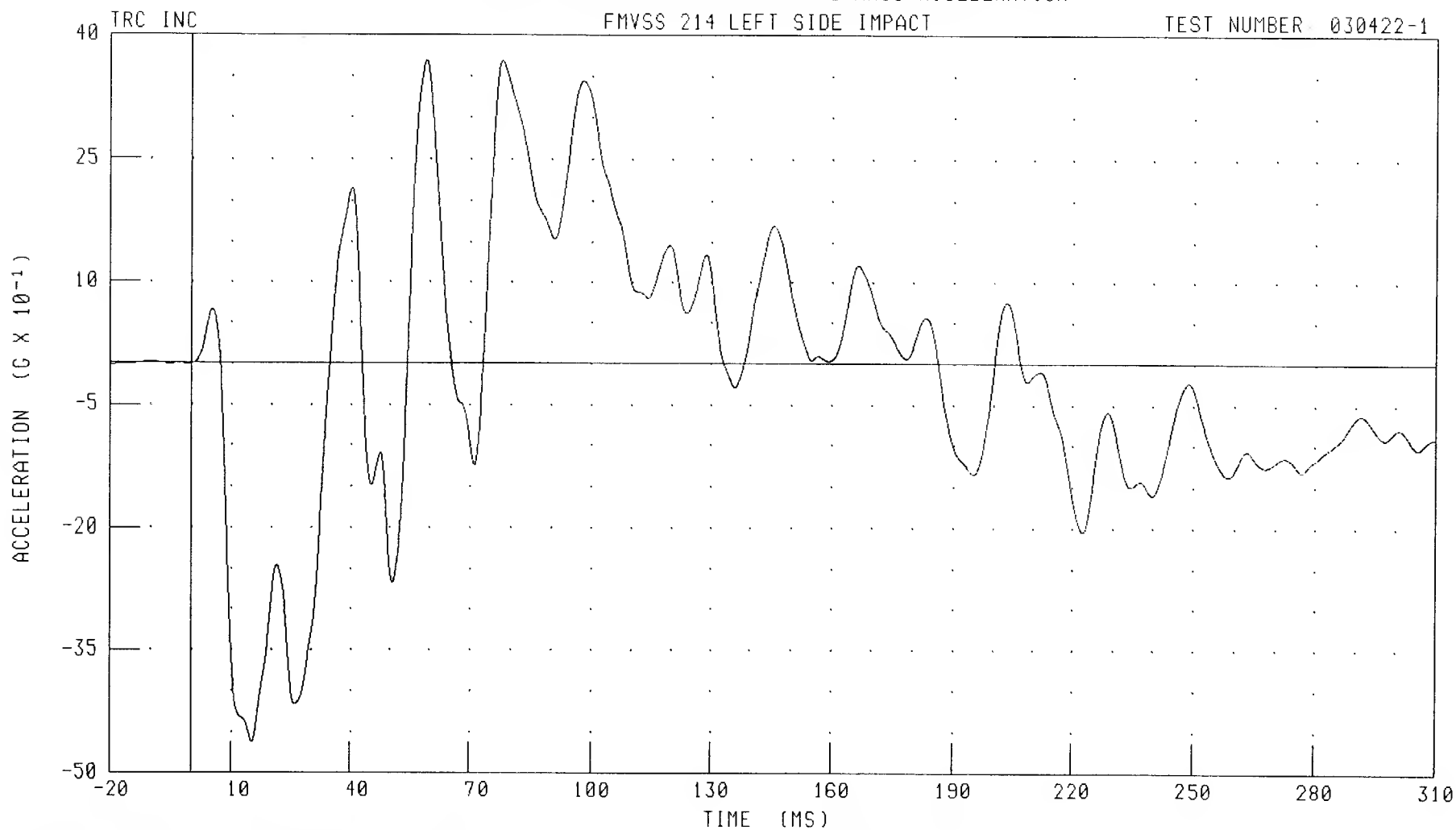
B-96

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
RIGHT SIDE SILL AT REAR SEAT Z-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL: RRSZG1

FILTER: CH. CLASS 60

PEAK DATA: 3 70 G @ 59.12 MS; -4.62 G @ 15.12 MS

B-97

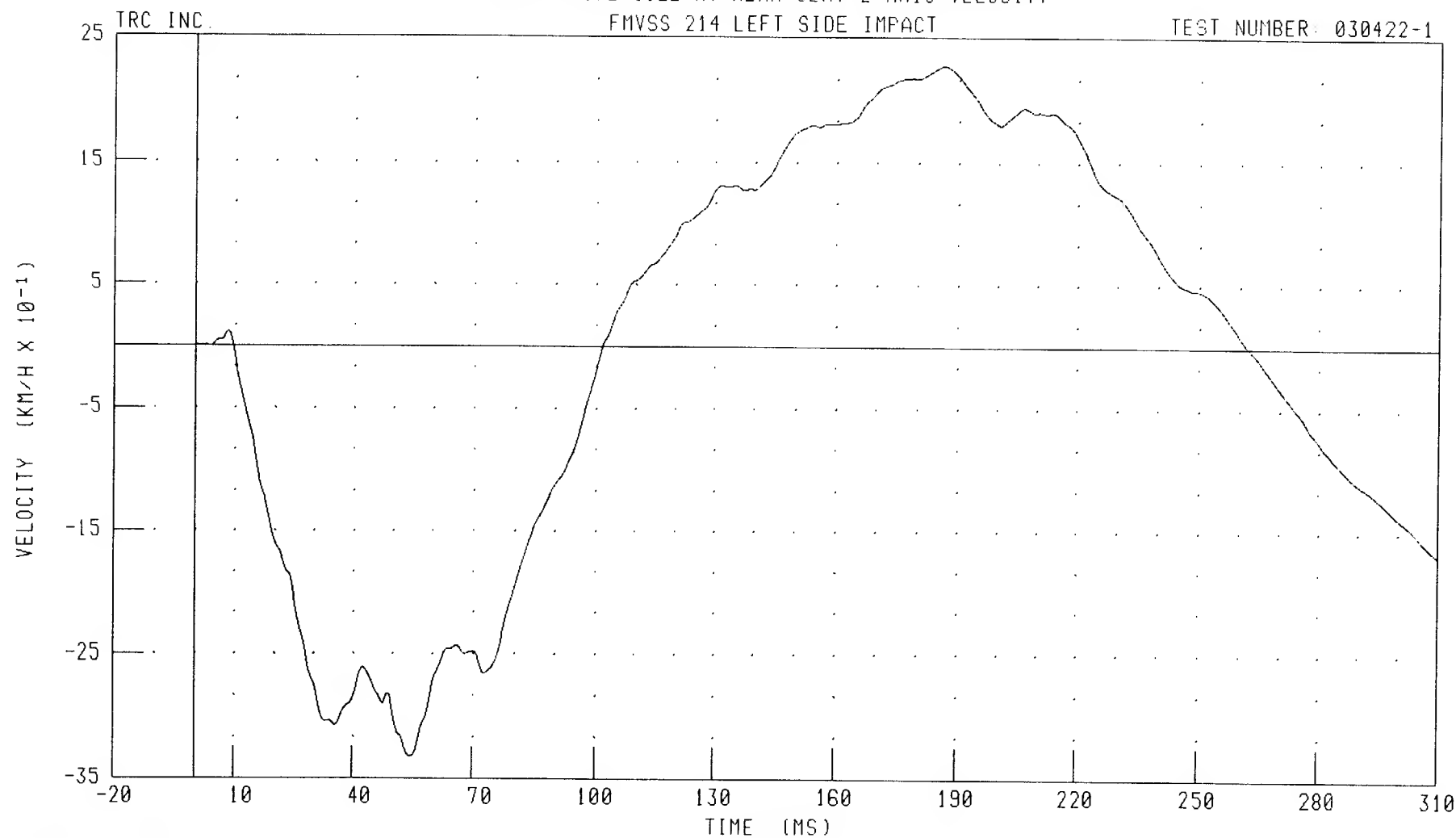
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

RIGHT SIDE SILL AT REAR SEAT Z-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



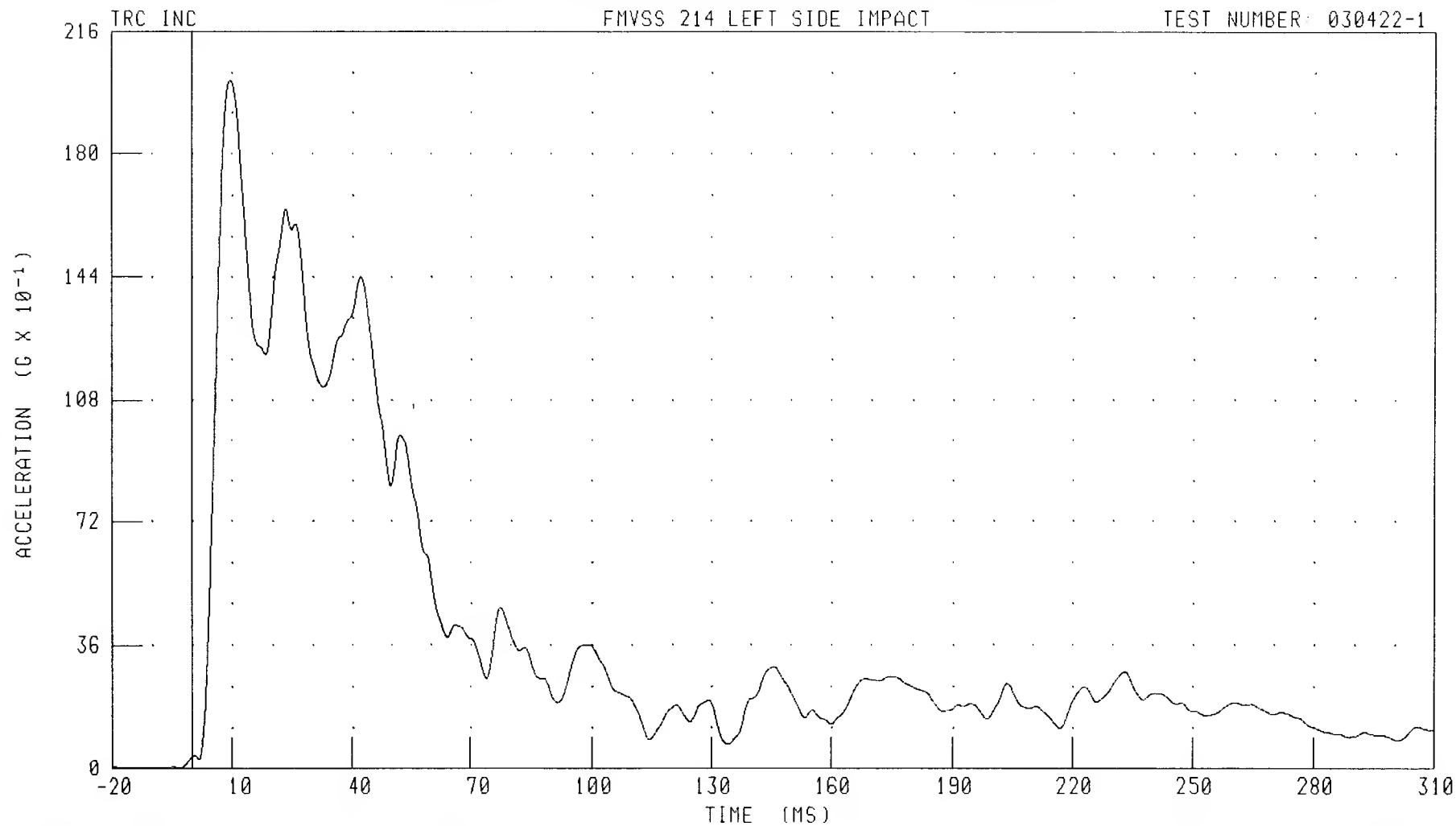
B-98

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
RIGHT SIDE SILL AT REAR SEAT RESULTANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: RRSRG1 FILTER: CH. CLASS 60

PEAK DATA: 20.18 G @ 9.52 MS; 0.02 G @ -8.32 MS

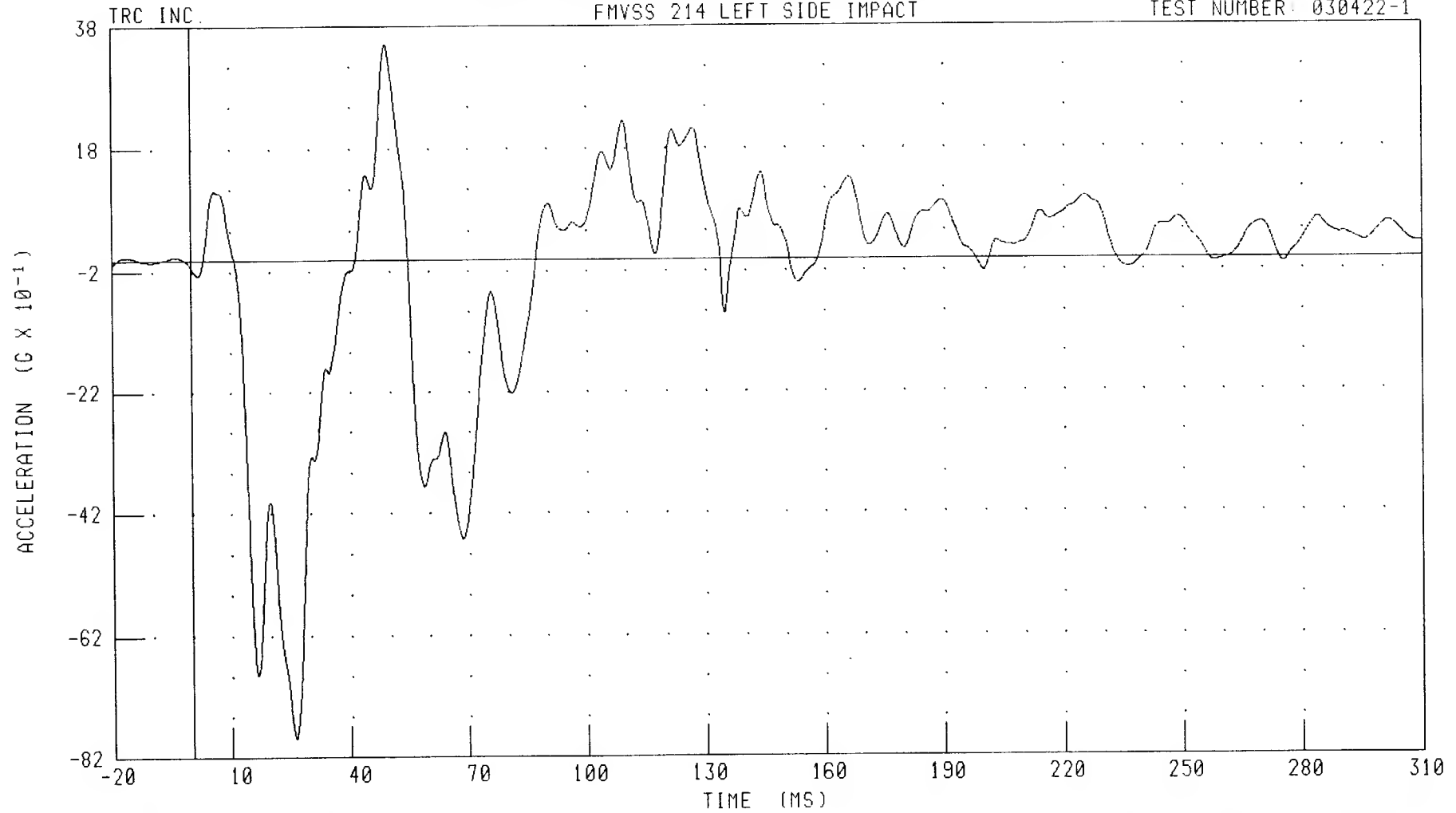
B-99

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
REAR FLOORPAN ABOVE AXLE X-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: RDKXC1 FILTER: CH. CLASS 60

PEAK DATA: 3.50 G @ 49.28 MS; -7.89 G @ 26.16 MS

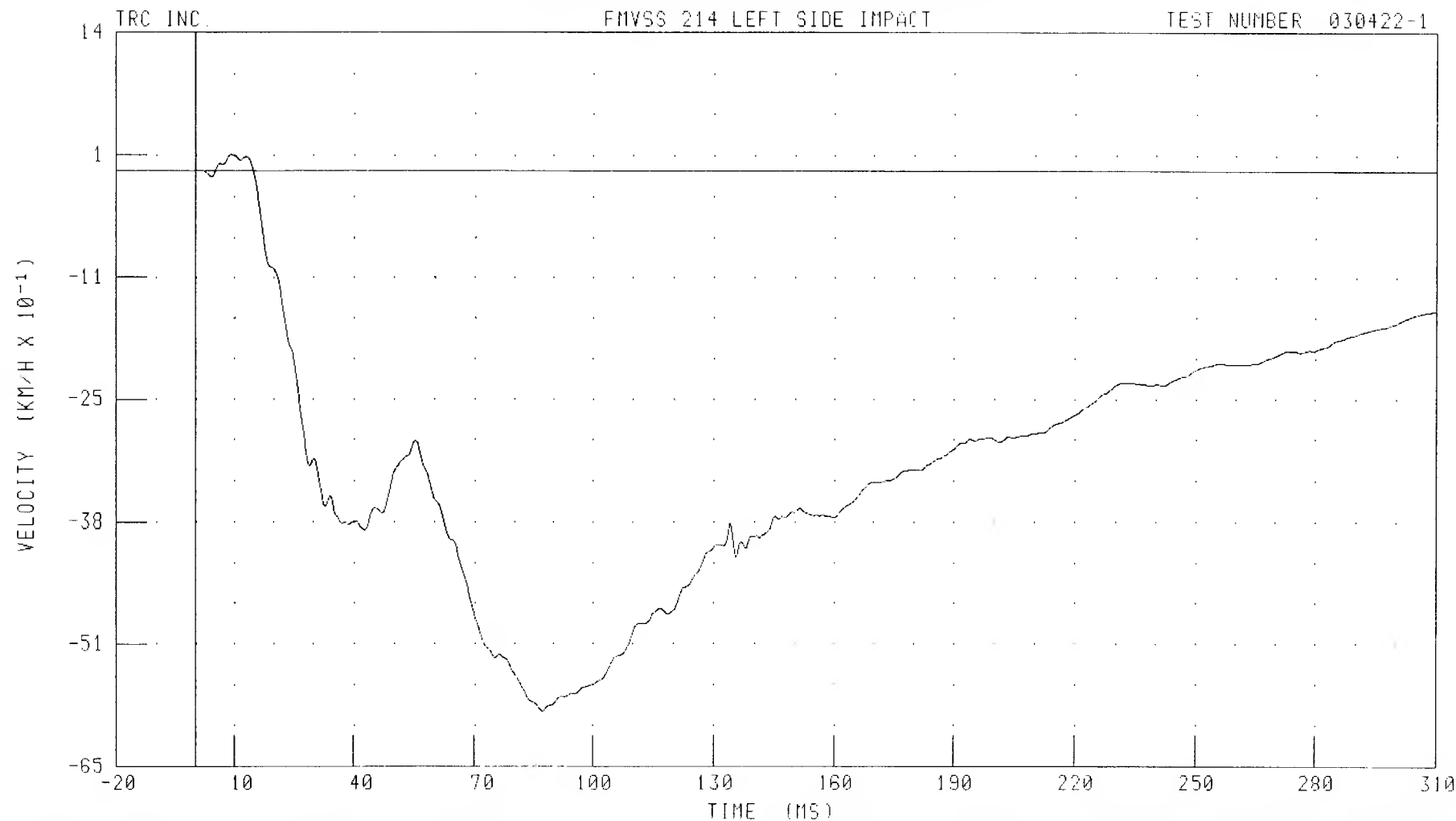
B-100

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
REAR FLOORPAN ABOVE AXLE X-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL RDKXV1 FILTER CH CLASS 100

PEAK DATA 0 18 KM/H @ 9 20 MS; -5 90 KM/H @ 87 20 MS

B-101

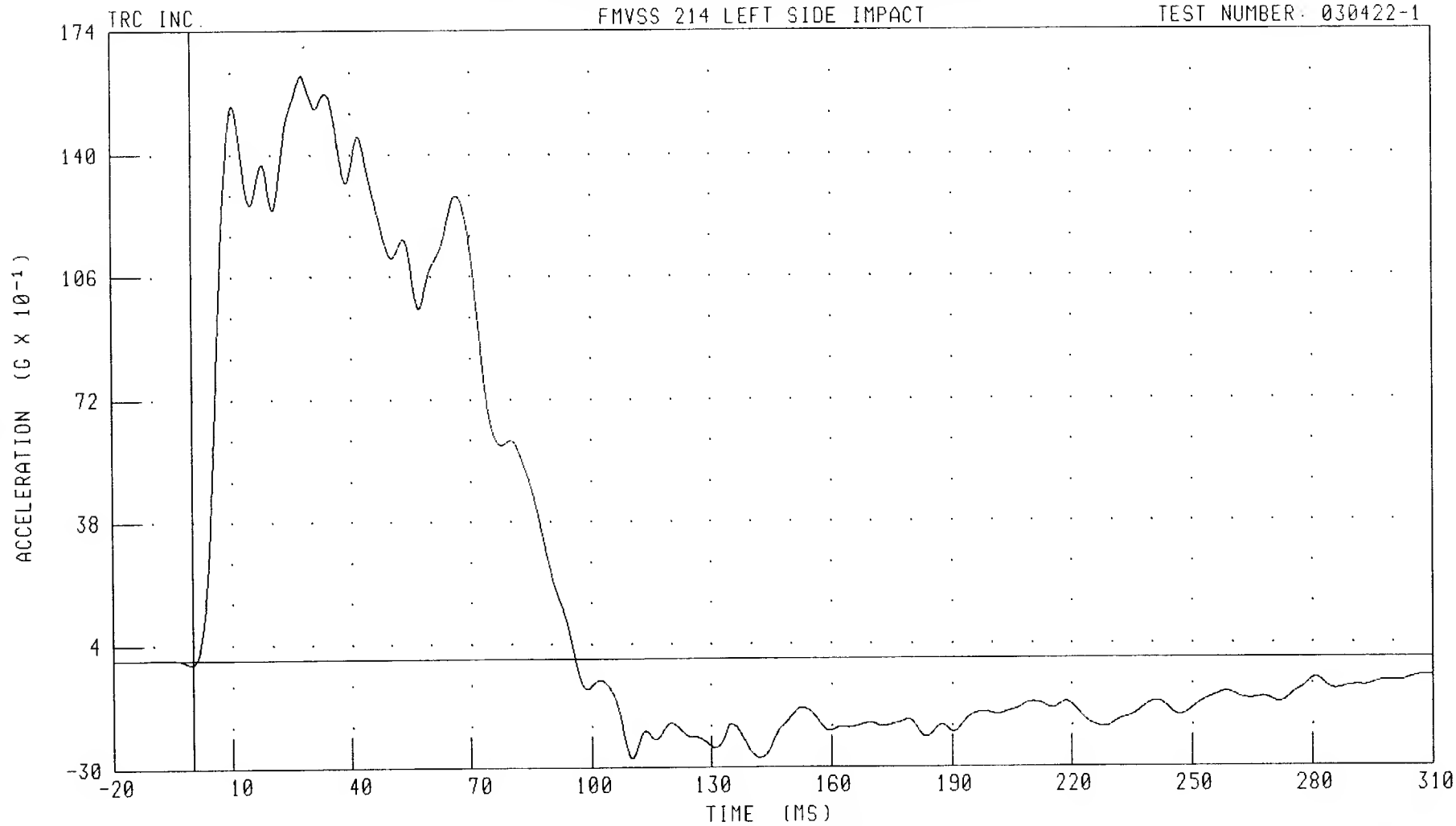
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

REAR FLOORPAN ABOVE AXLE Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



B-102

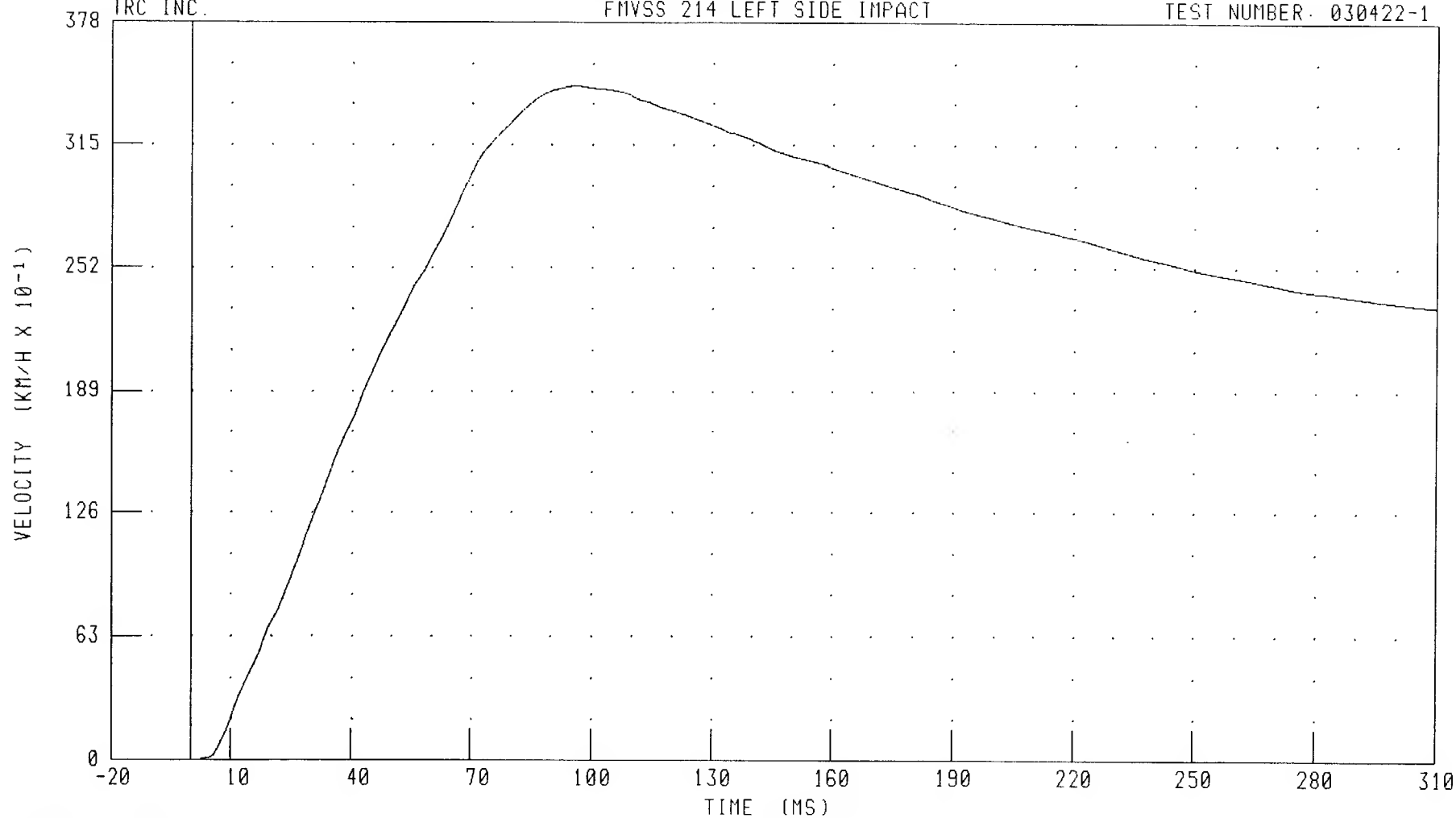
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
REAR FLOORPAN ABOVE AXLE Y-AXIS VELOCITY

TRC INC.

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: RDKYV1 FILTER: CH. CLASS 180

PEAK DATA: 34 55 KM/H @ 96 08 MS; 0.00 KM/H @ 1.20 MS

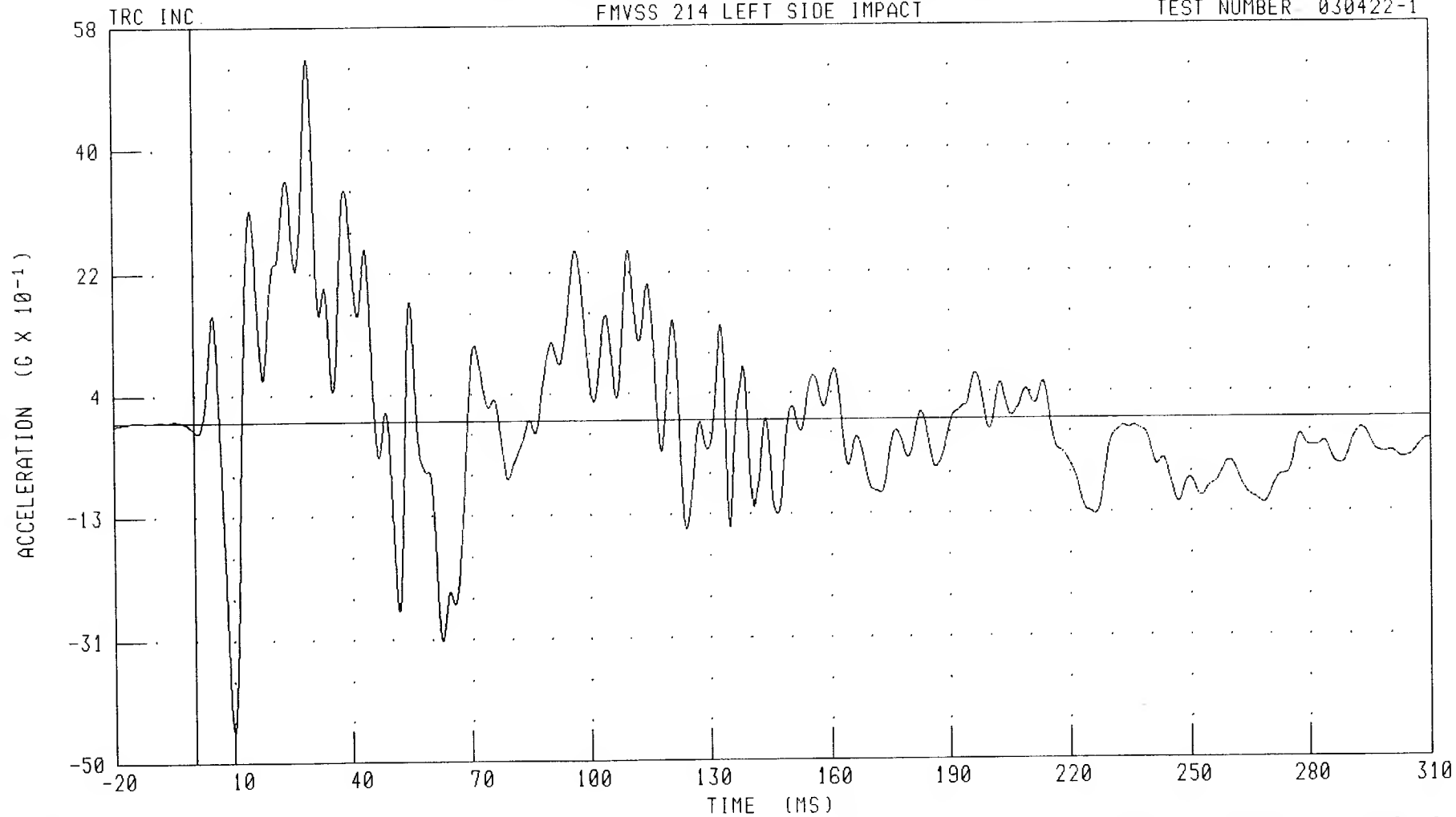
B-103

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
REAR FLOORPAN ABOVE AXLE Z-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL: RDKZG1 FILTER: CH CLASS 60

PEAK DATA: 5.33 G @ 29.36 MS; -4.55 G @ 10.00 MS

B-104

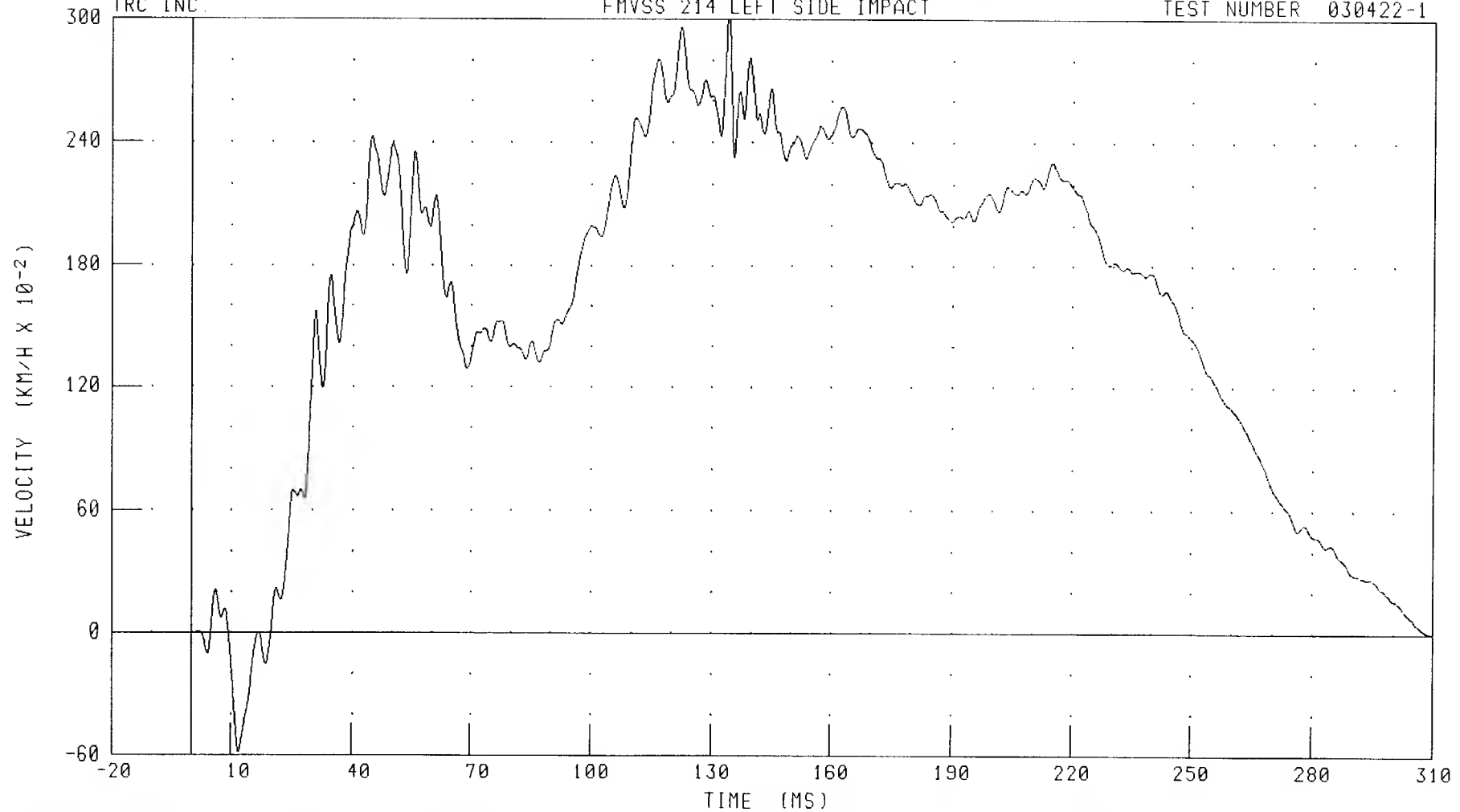
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
REAR FLOORPAN ABOVE AXLE Z-AXIS VELOCITY

TRC INC.

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL: ROKZV1 FILTER: CH. CLASS 180

PEAK DATA: 3.10 KM/H @ 134.08 MS; -0.58 KM/H @ 11.92 MS

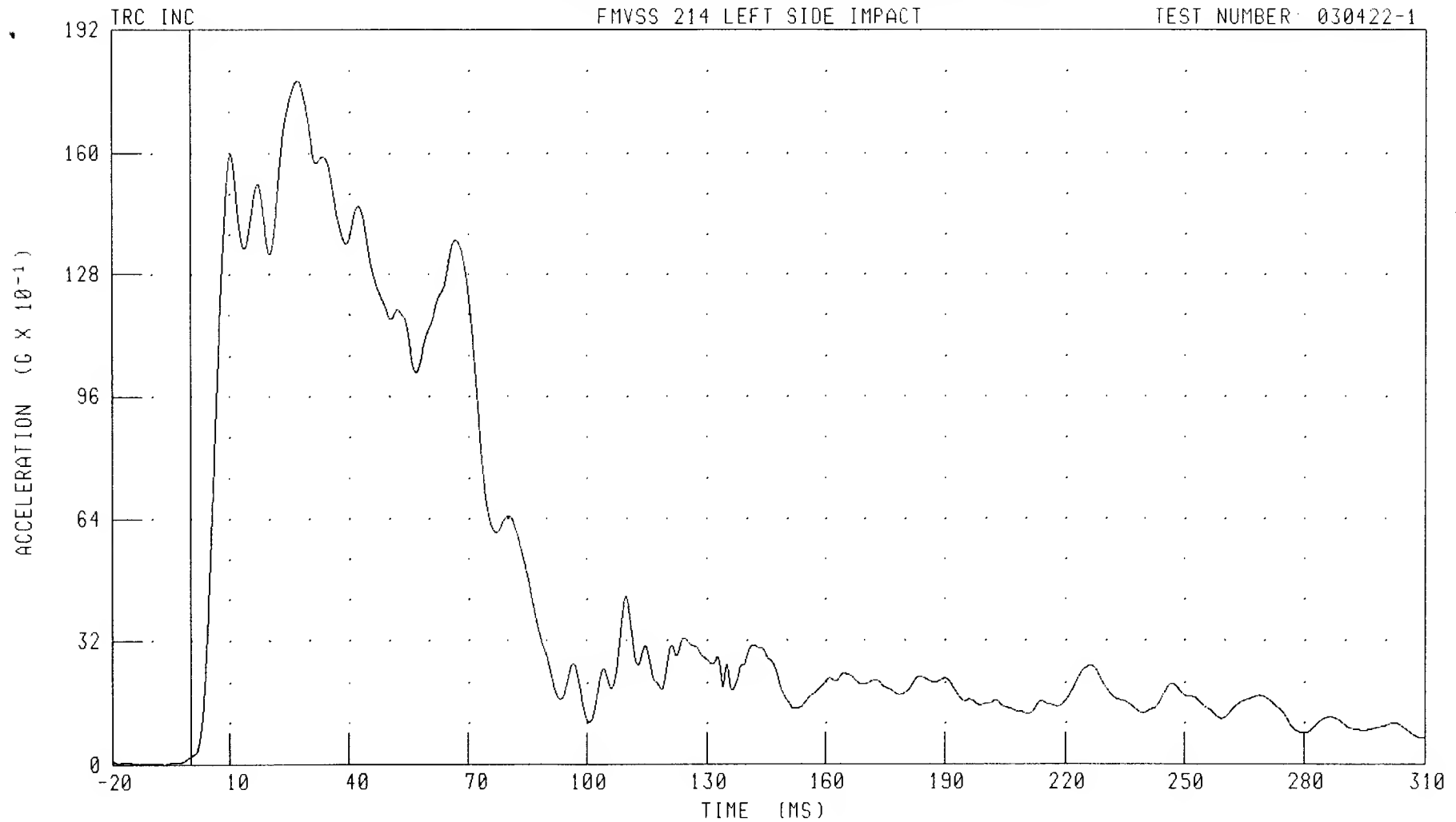
B-105

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
REAR FLOORPAN ABOVE AXLE RESULTANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: RDKRG1 FILTER: CH CLASS 60

PEAK DATA 17.87 G @ 27.20 MS; 0.01 G @ -6.88 MS

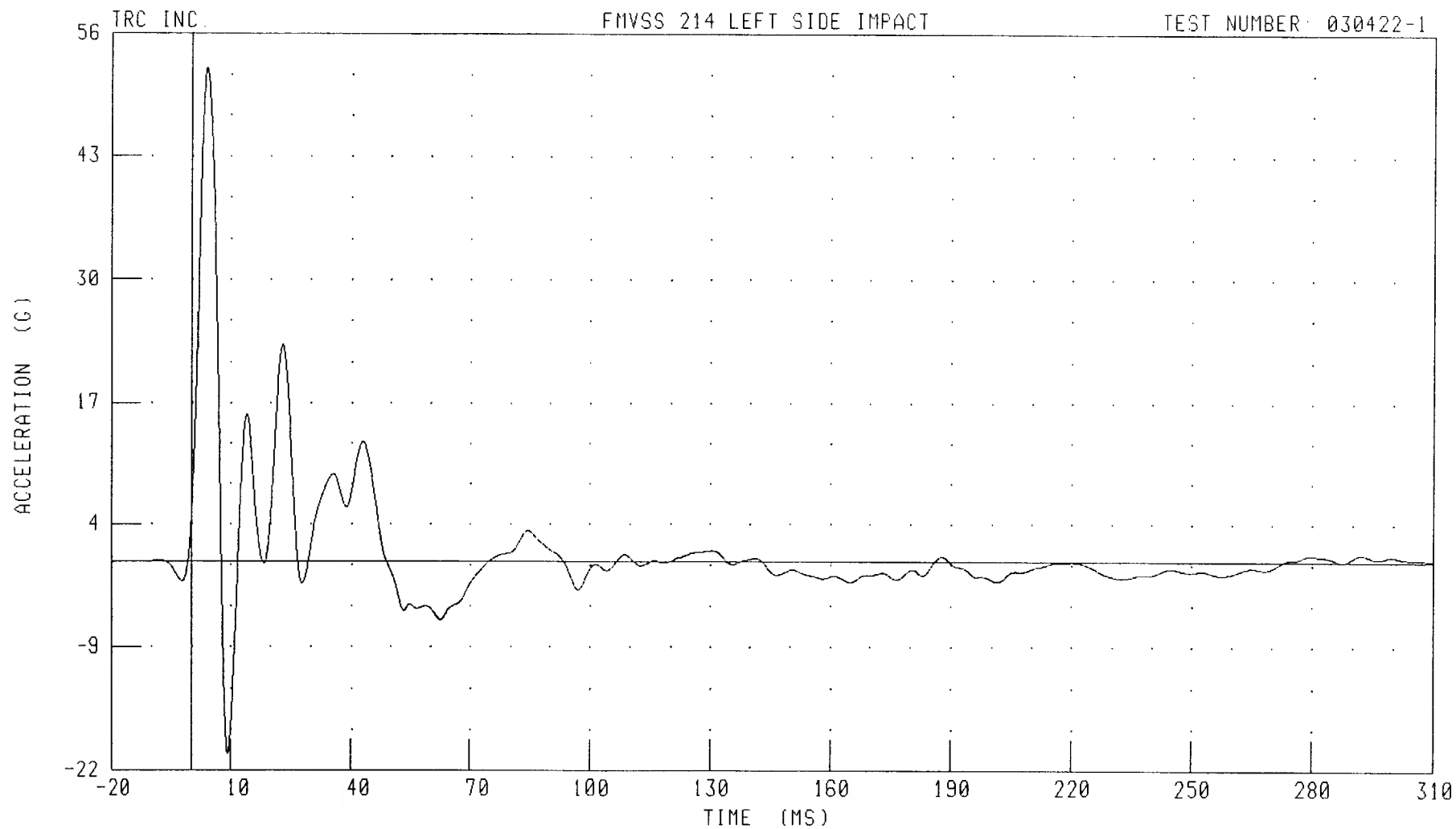
B-106

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT SIDE SILL AT FRONT SEAT Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: LFSYG1 FILTER CH. CLASS 60

PEAK DATA: 52.45 G @ 3.84 MS; -20.21 G @ 9.20 MS

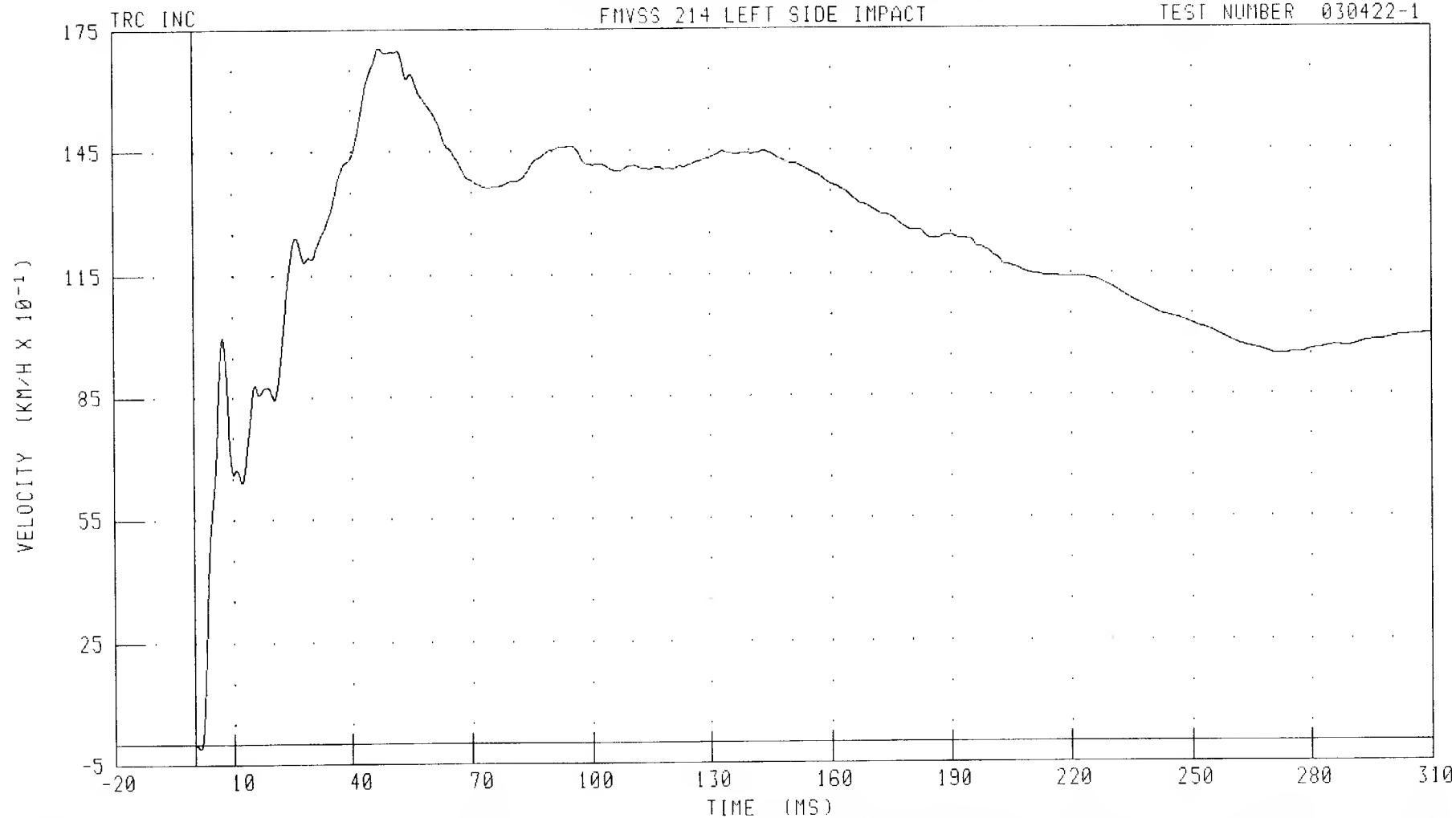
B-107

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT SIDE SILL AT FRONT SEAT Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL LFSYV1 FILTER CH CLASS 180

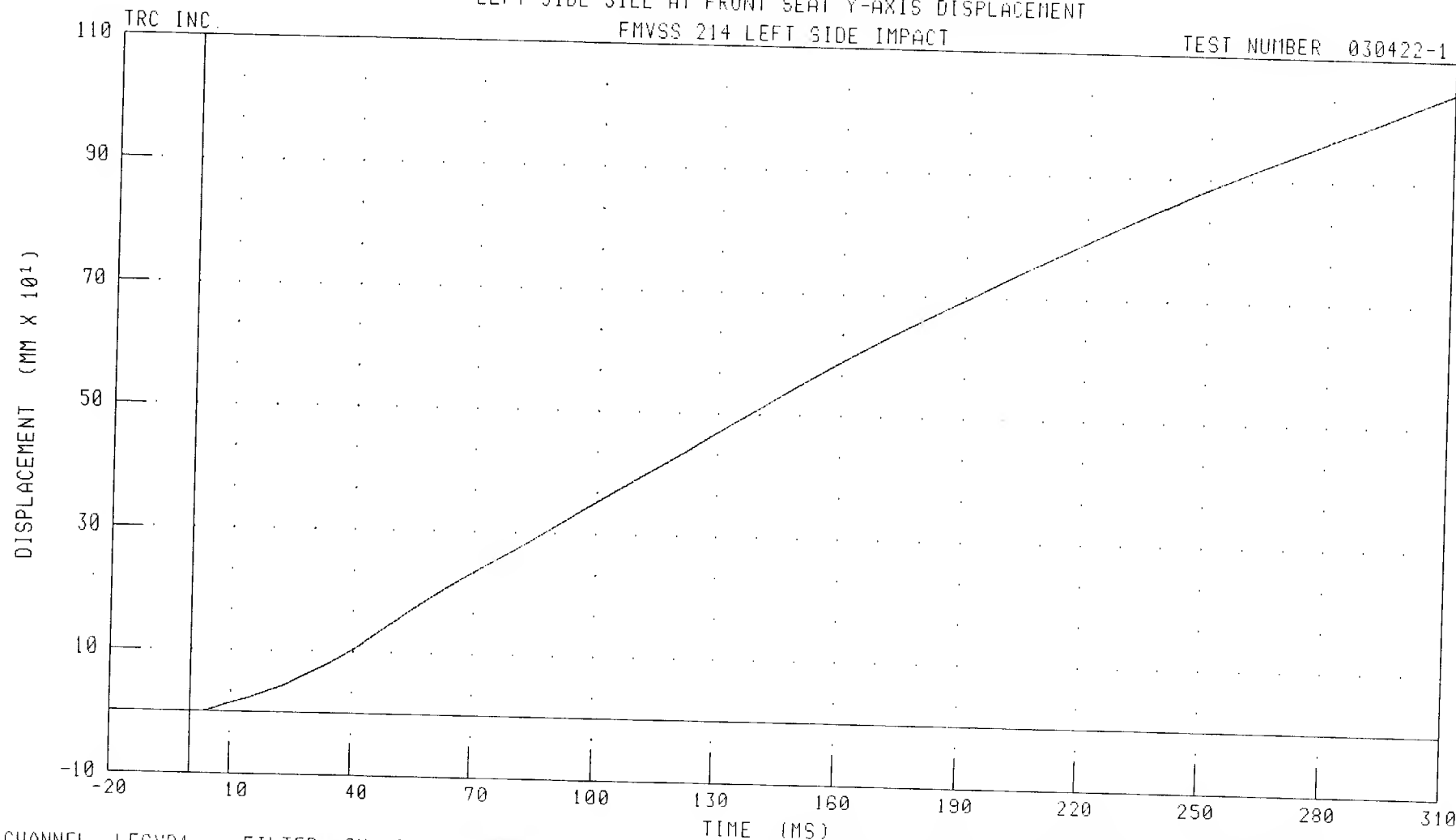
PEAK DATA 17 03 KM/H @ 47 44 MS, -0 11 KM/H @ 1 44 MS

B-108

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT SIDE SILL AT FRONT SEAT Y-AXIS DISPLACEMENT
FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL LFSYD1 FILTER CH. CLASS 180

PEAK DATA 1046 90 MM @ 310 00 MS; -0 03 MM @ 1 92 MS

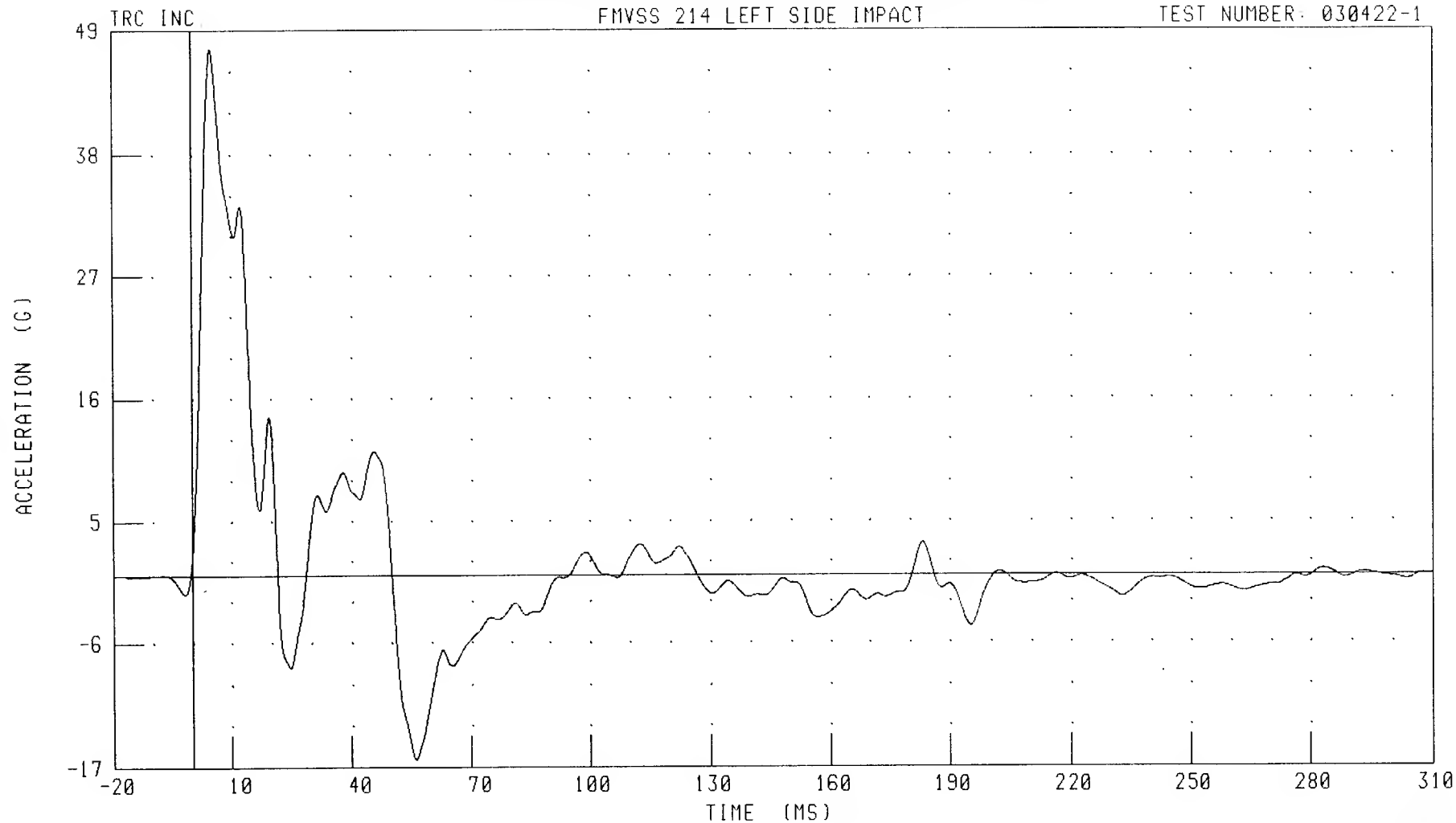
B-109

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT SIDE SILL AT REAR SEAT Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: LRSYG1 FILTER: CH. CLASS 60

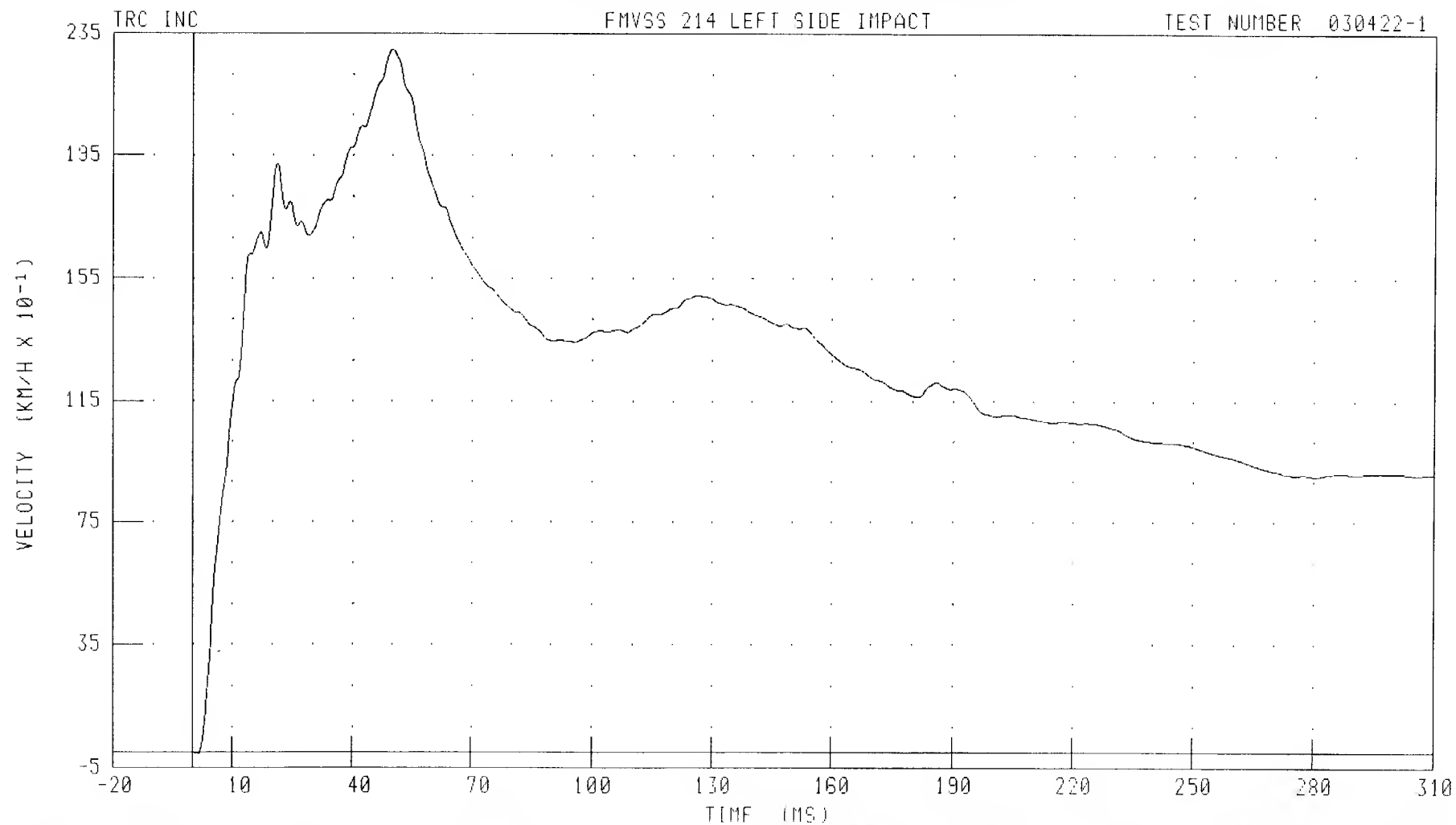
B-110

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT SIDE SILL AT REAR SEAT Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL LRSYV1 FILTER CH CLASS 180

PEAK DATA 22.98 KM/H @ 50.00 MS, -0.04 KM/H @ 1.36 MS

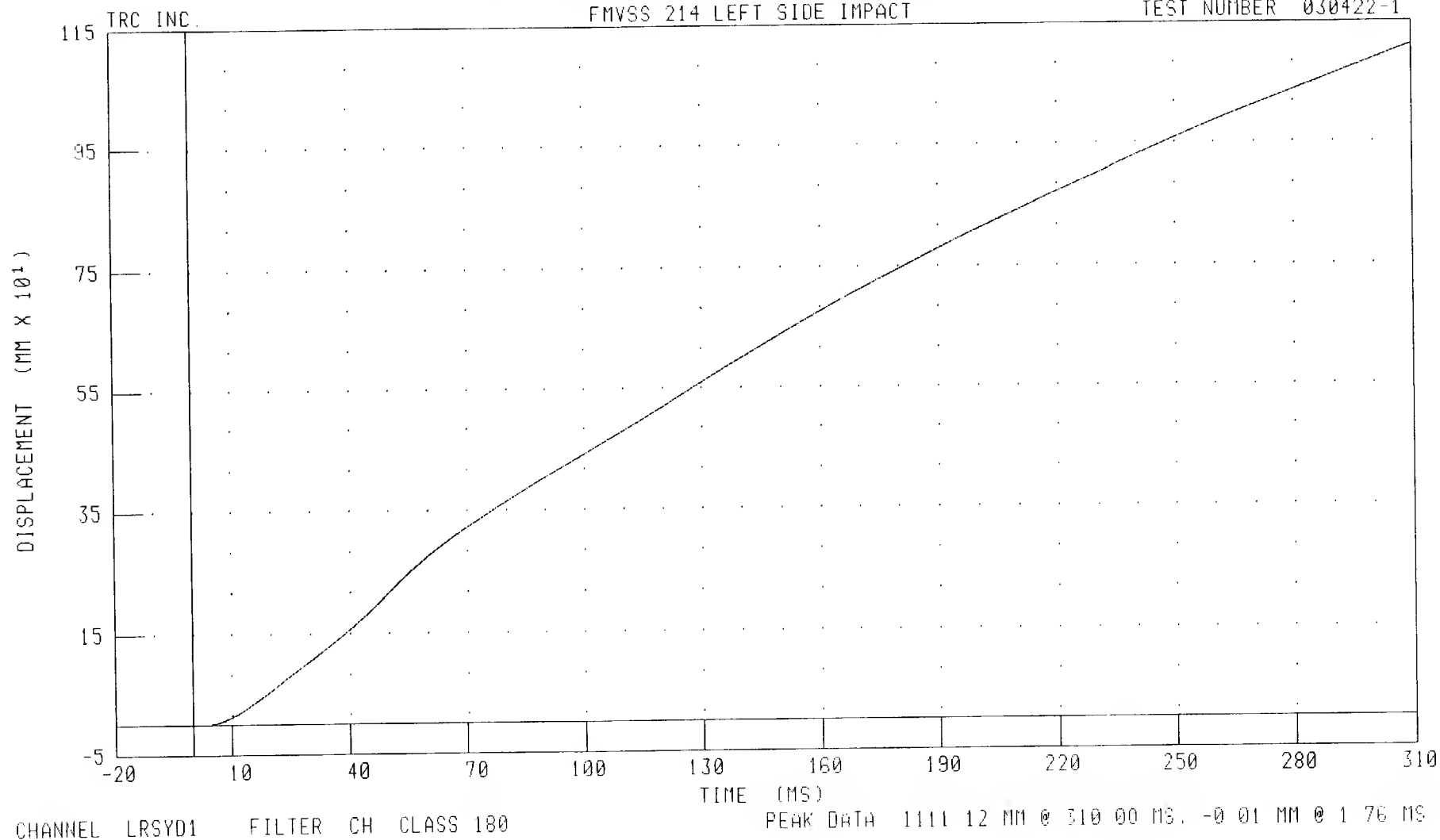
B-1111

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT SIDE SILL AT REAR SEAT Y-AXIS DISPLACEMENT

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



B-112

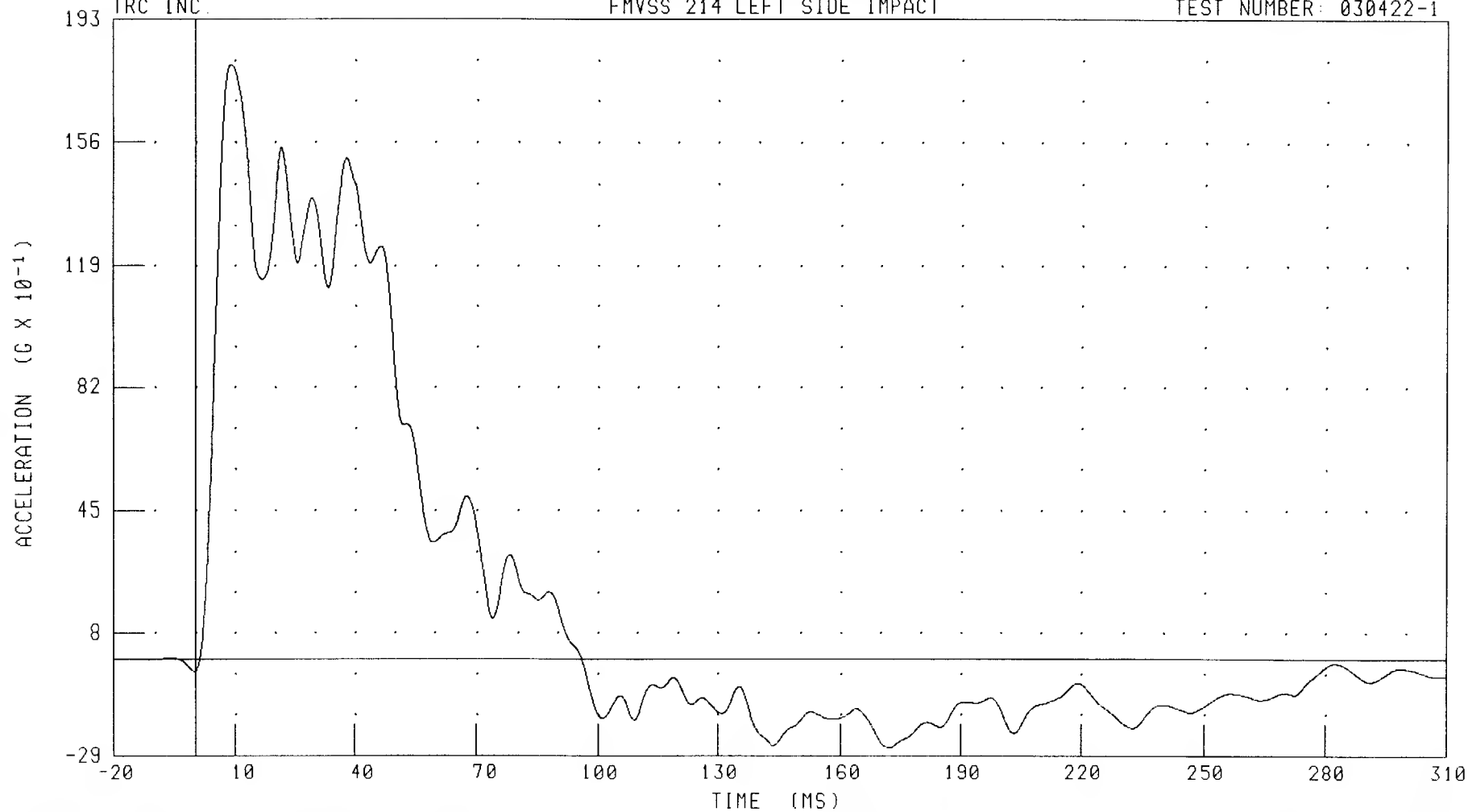
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
RIGHT REAR OCCUPANT COMPARTMENT Y-AXIS ACCELERATION

TRC INC.

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: RRTYG1 FILTER: CH CLASS 60

PEAK DATA: 17.94 G @ 8.96 MS, -2.66 G @ 172.40 MS

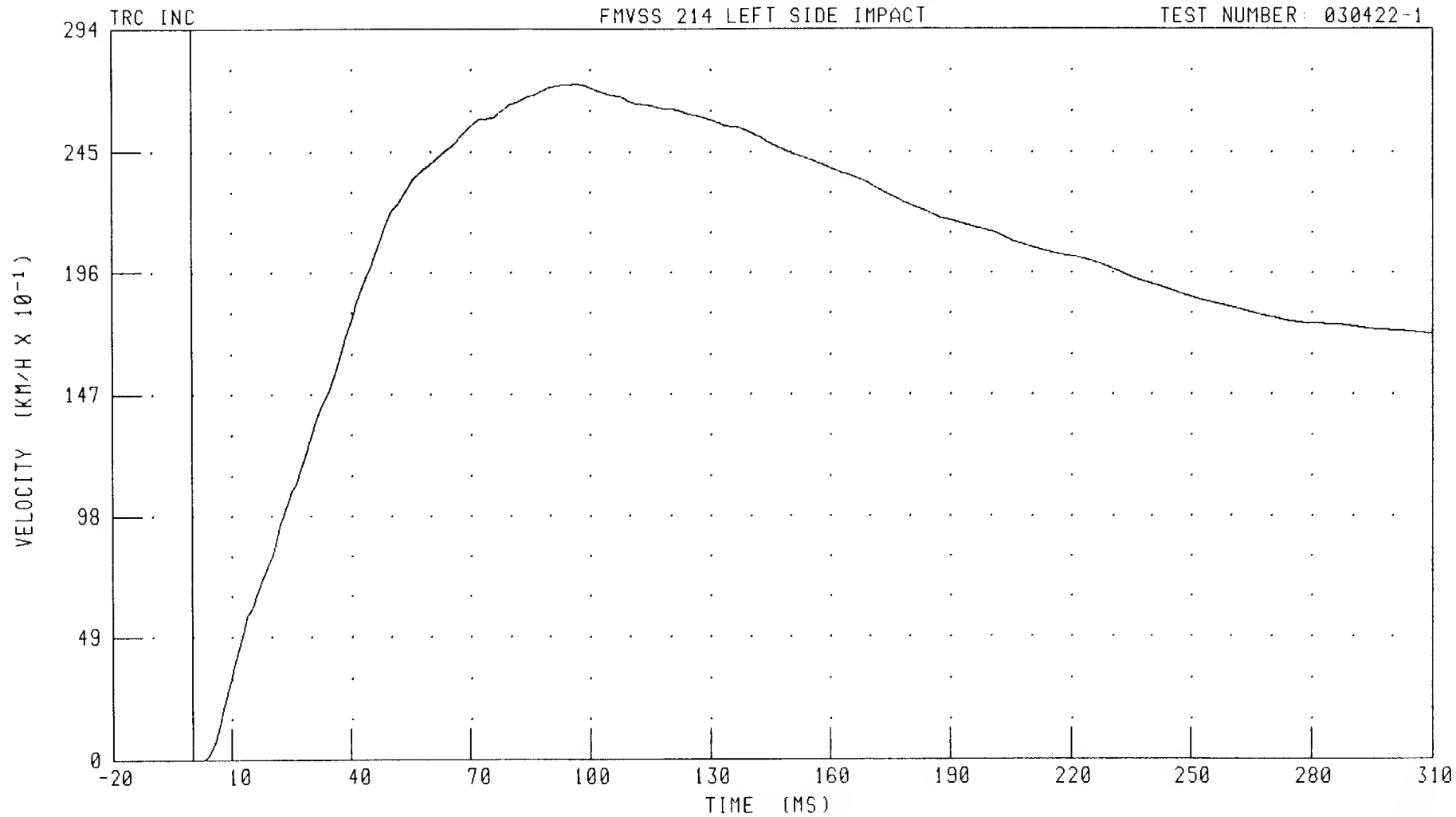
B-113

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
RIGHT REAR OCCUPANT COMPARTMENT Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: RRTYV1 FILTER: CH. CLASS 180

PEAK DATA 27 20 KM/H @ 96 56 MS; 0.00 KM/H @ 2 00 MS

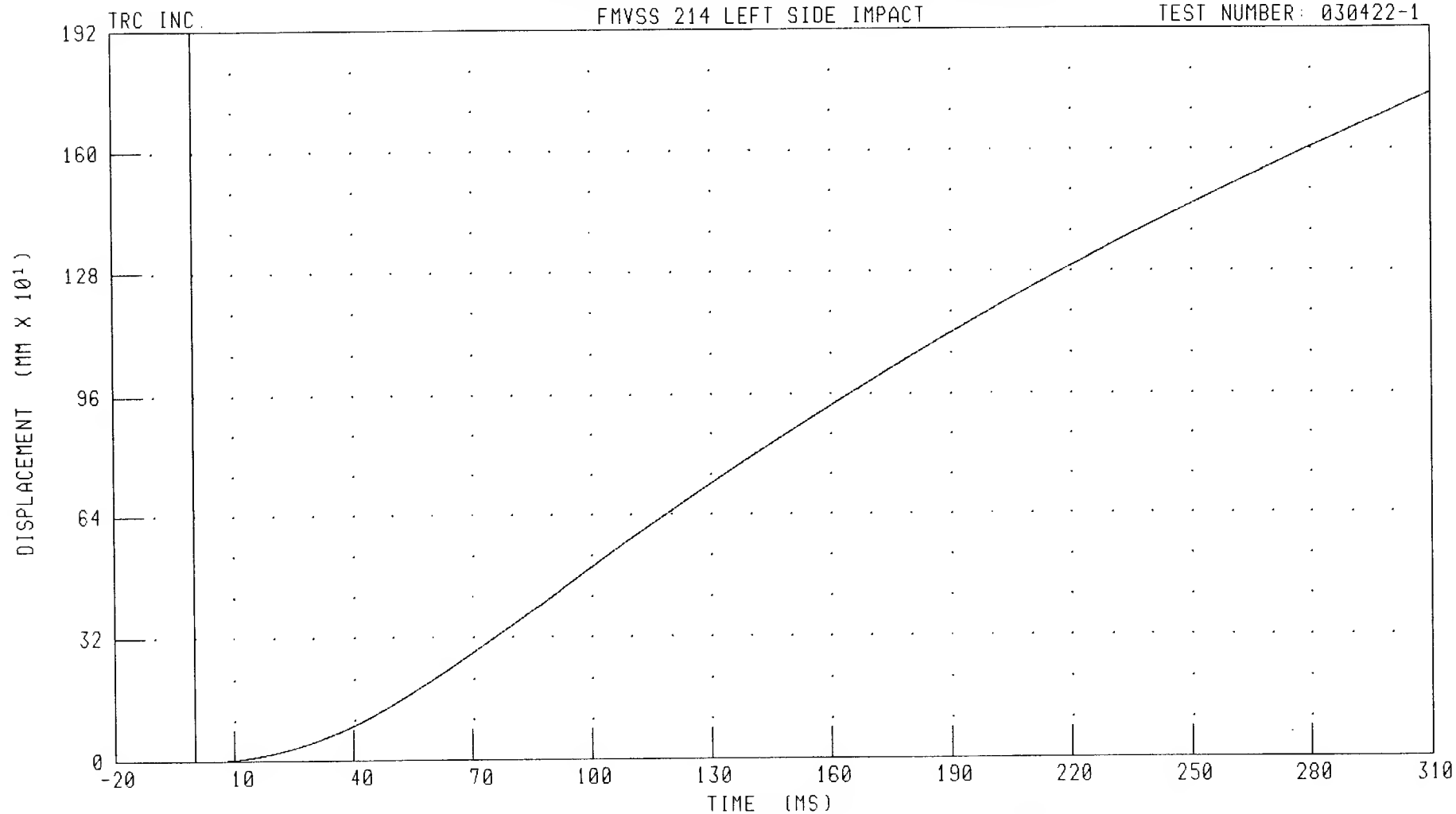
B-114

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
RIGHT REAR OCCUPANT COMPARTMENT Y-AXIS DISPLACEMENT

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: RRTYD1 FILTER CH CLASS 180

PEAK DATA: 1748 69 MM @ 310 00 MS; 0 00 MM @ 0 00 MS

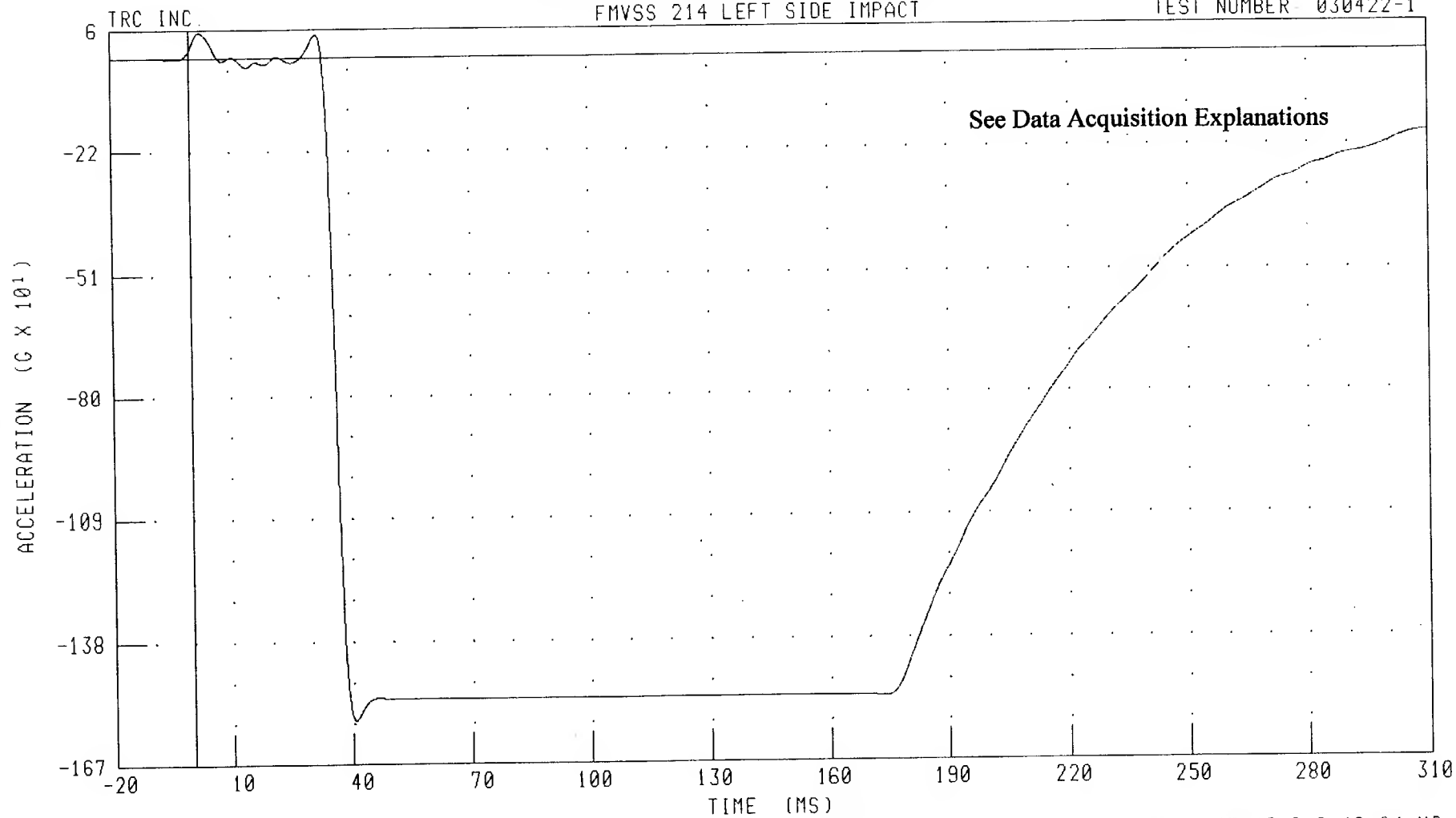
B-115

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT LOWER A-POST Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL LLAGC1 FILTER CH. CLASS 60

PEAK DATA 63.46 G @ 2.72 MS, -1567.40 G @ 40.64 MS

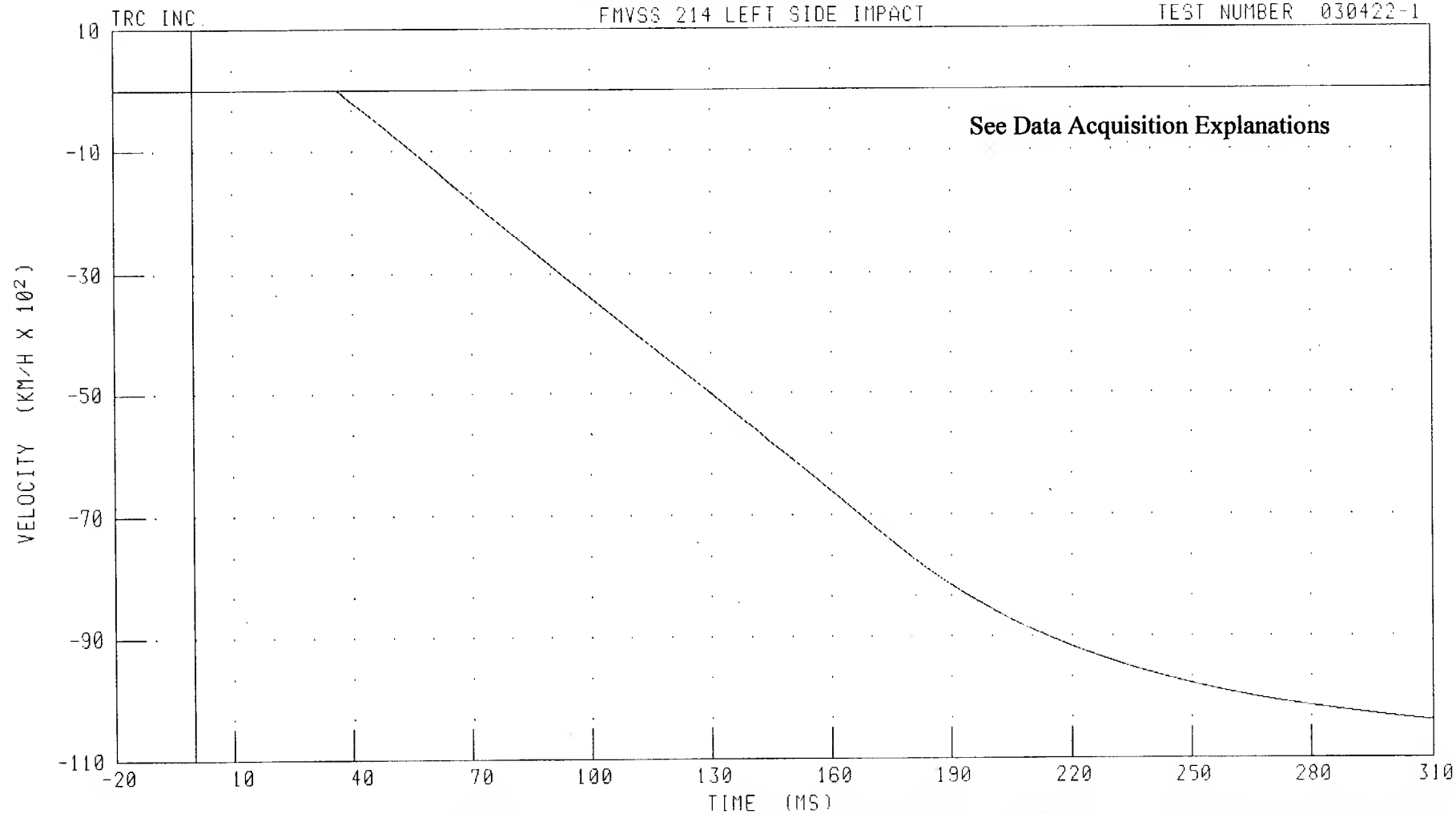
B-116

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT LOWER A-POST Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



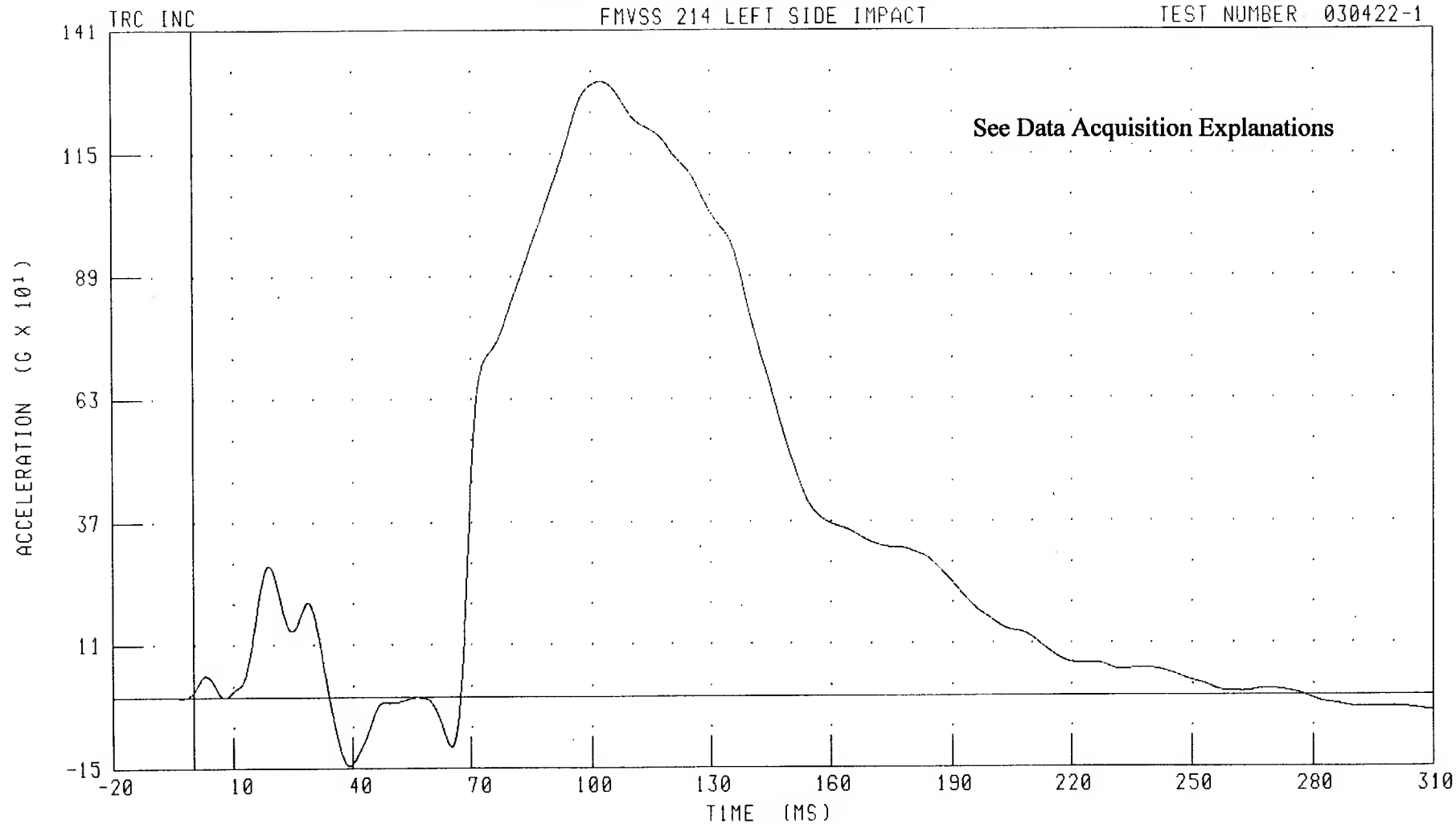
CHANNEL LLAYV1 FILTER CH. CLASS 180

PEAK DATA 11 47 KM/H @ 6 64 MS, -10400 93 KM/H @ 310 00 MS

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT MIDDLE A-POST Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL: LMAYG1 FILTER: CH. CLASS 60

B-118

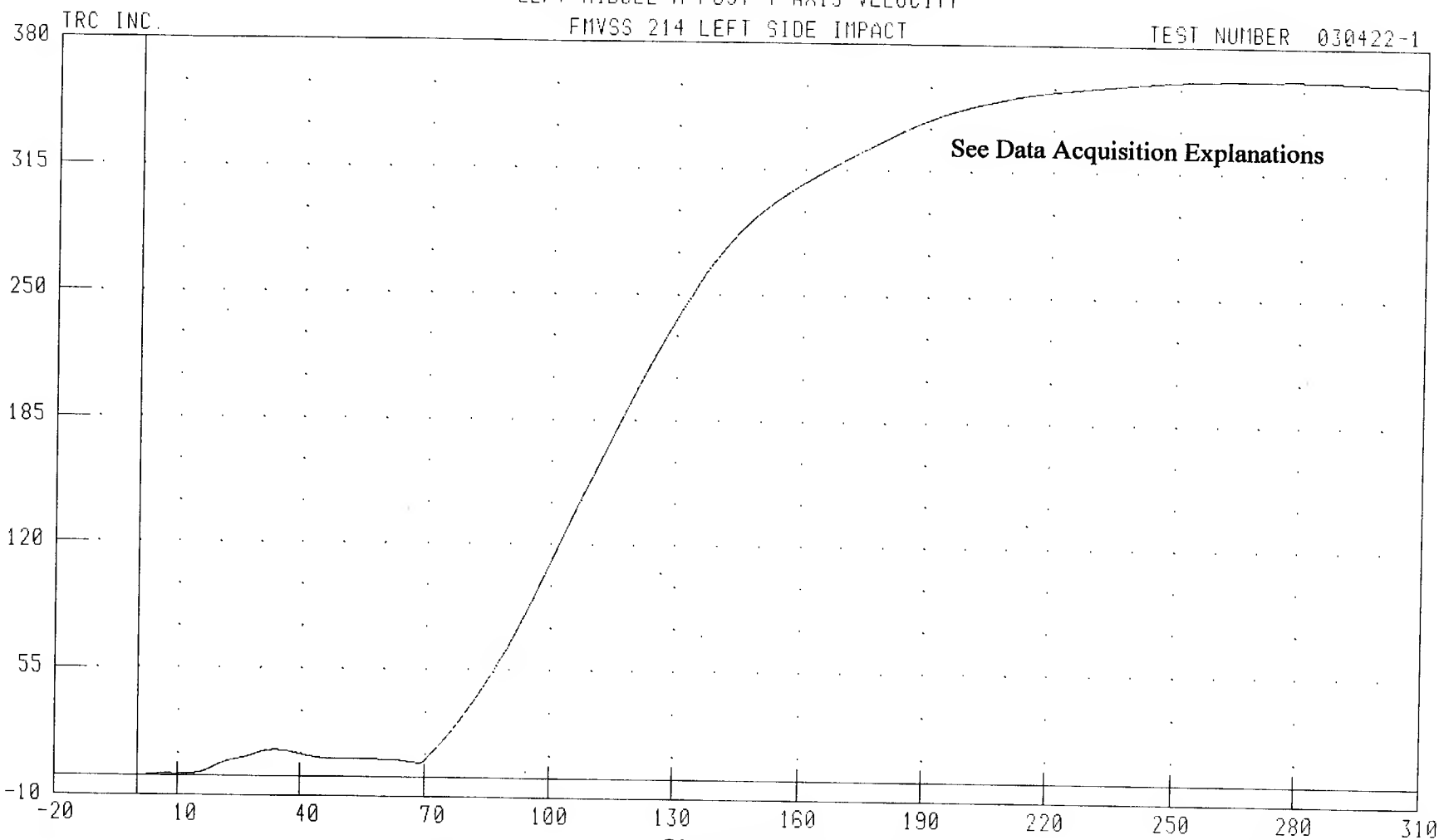
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

LEFT MIDDLE A-POST Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL: LMAYV1 FILTER: CH. CLASS 180

TIME (MS)

PEAK DATA 3633 63 KM/H @ 277 44 MS, -0 06 KM/H @ 0 88 MS

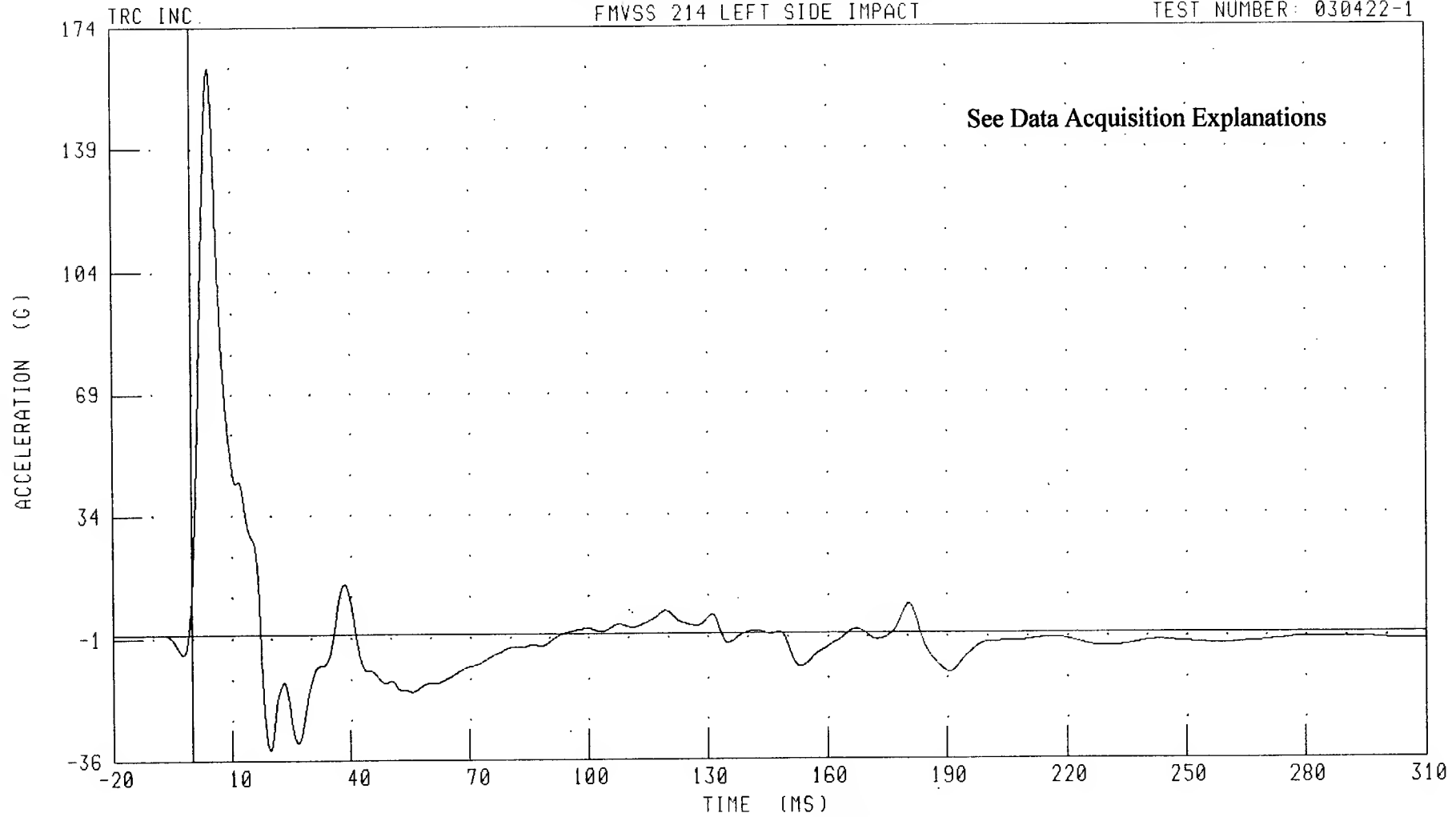
B-119

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT LOWER B-POST Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: LLBYG1 FILTER: CH. CLASS 60

PEAK DATA: 162.30 G @ 4.56 MS; -32.97 G @ 19.84 MS

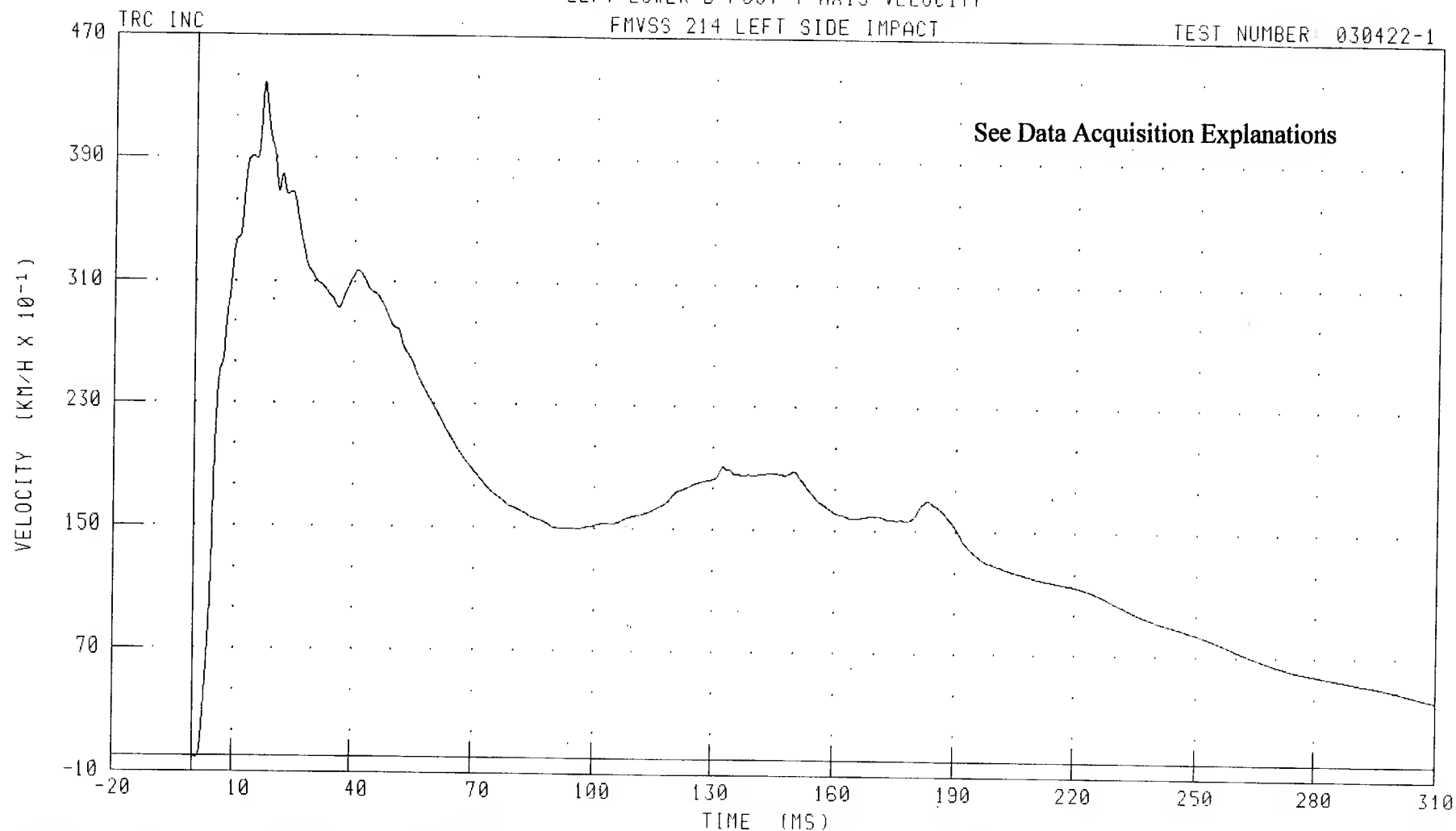
B-120

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT LOWER B-POST Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: LLBYV1 FILTER: CH CLASS 180

PEAK DATA 43 88 KM/H @ 17 28 MS, -0 11 KM/H @ 0 96 MS

B-121

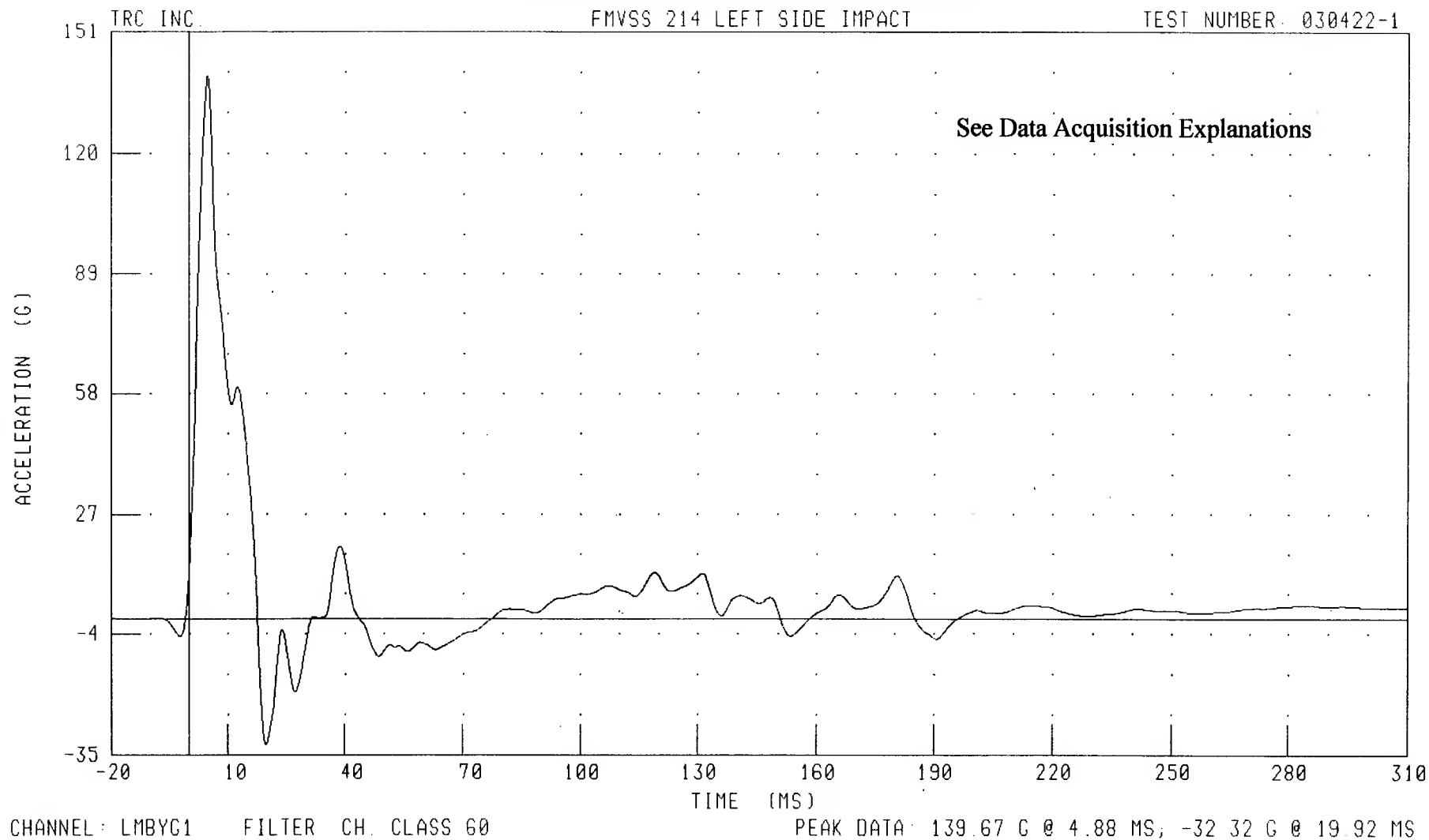
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

LEFT MIDDLE B-POST Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



B-122

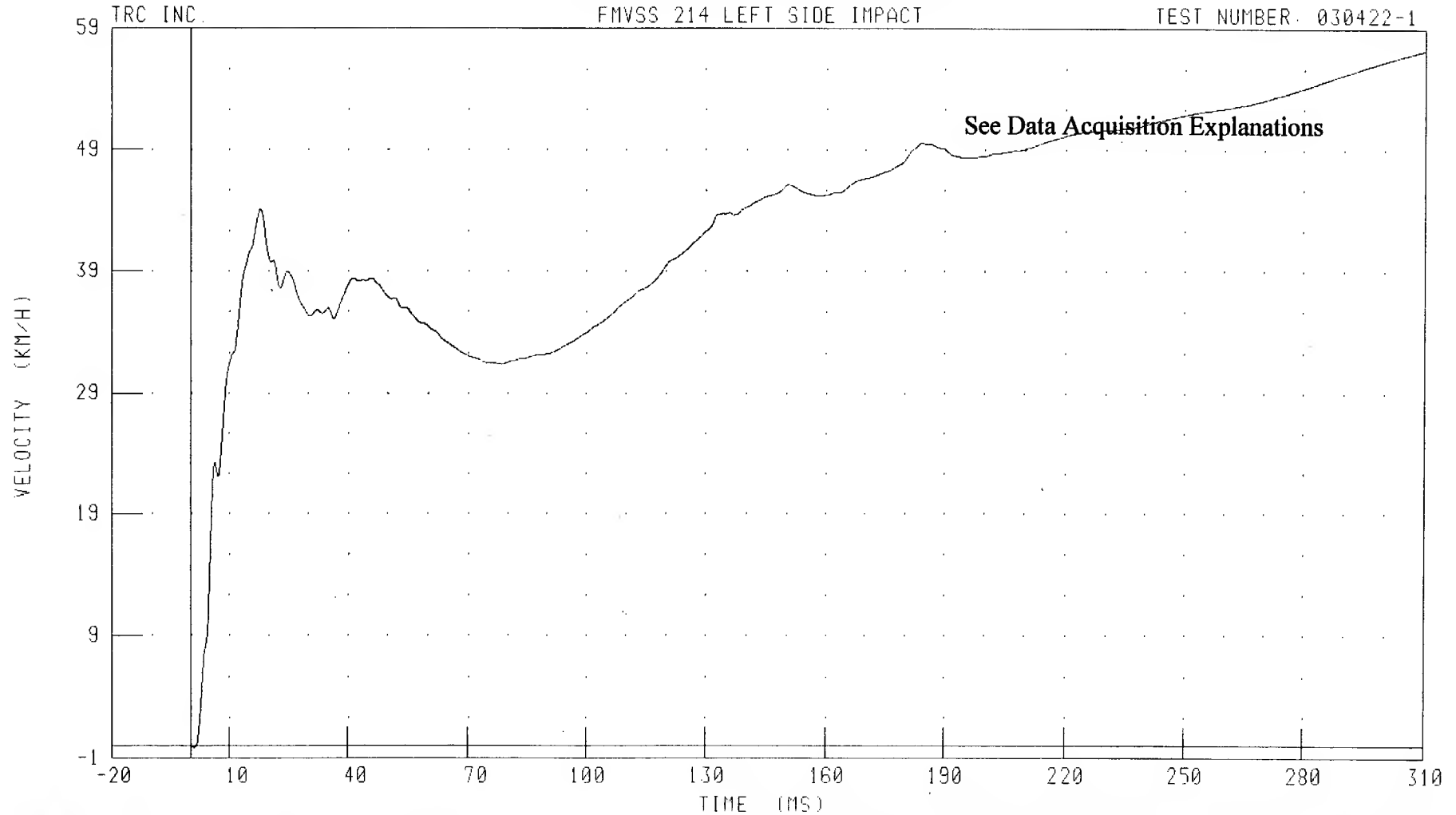
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT MIDDLE B-POST Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1

See Data Acquisition Explanations



CHANNEL: LMBYV1 FILTER CH. CLASS 180

PEAK DATA 57 27 KM/H @ 310 00 MS, -0 13 KM/H @ 1 04 MS

B-123

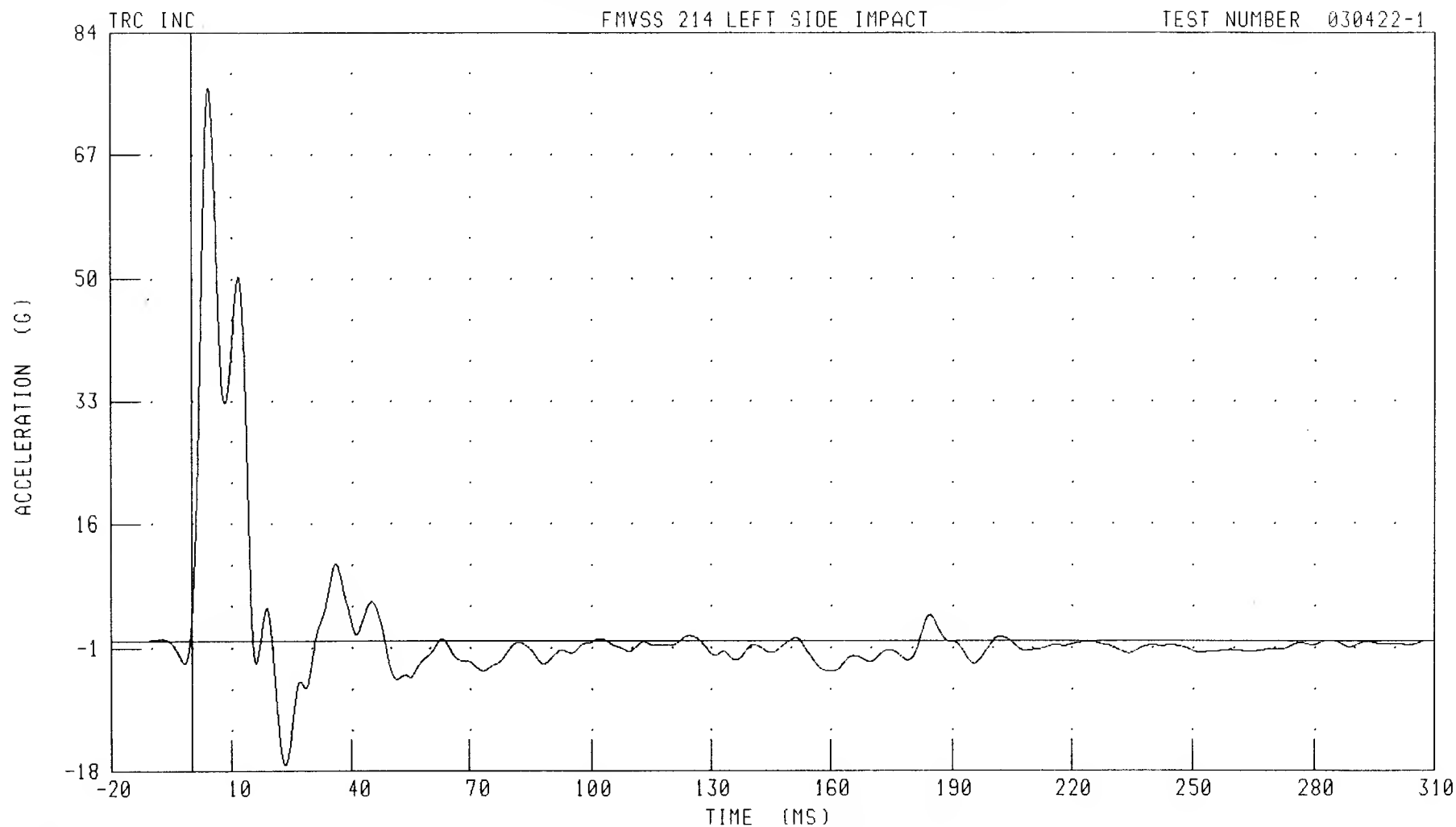
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

LEFT FRONT SEAT TRACK Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL: LFTYG1 FILTER: CH CLASS 60

PEAK DATA: 76.33 G @ 4.24 MS, -17.21 G @ 23.36 MS

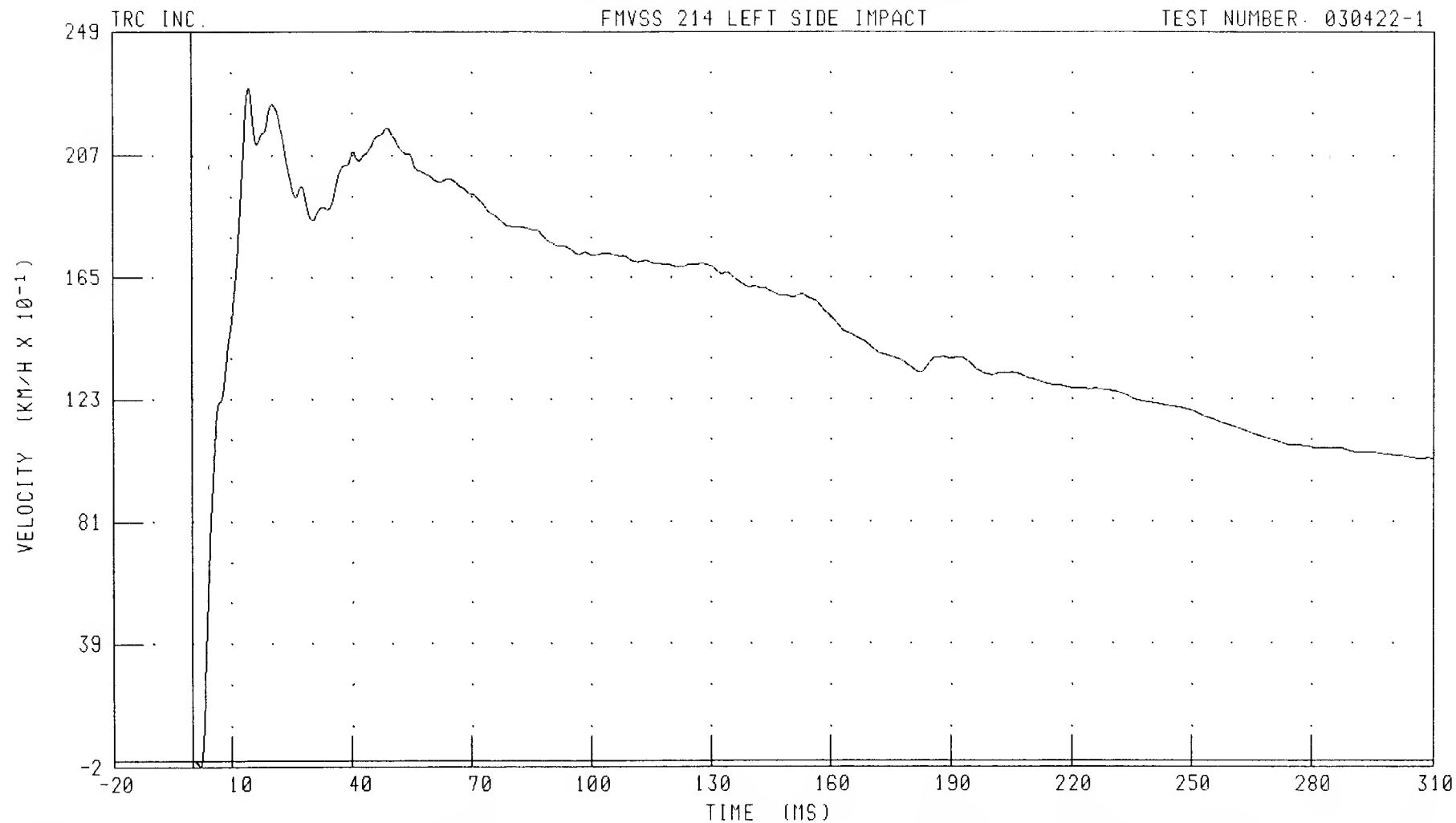
B-124

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT FRONT SEAT TRACK Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: LFTYV1 FILTER: CH. CLASS 180

PEAK DATA: 23 08 KM/H @ 14 24 MS; -0 19 KM/H @ 2 00 MS

B-125

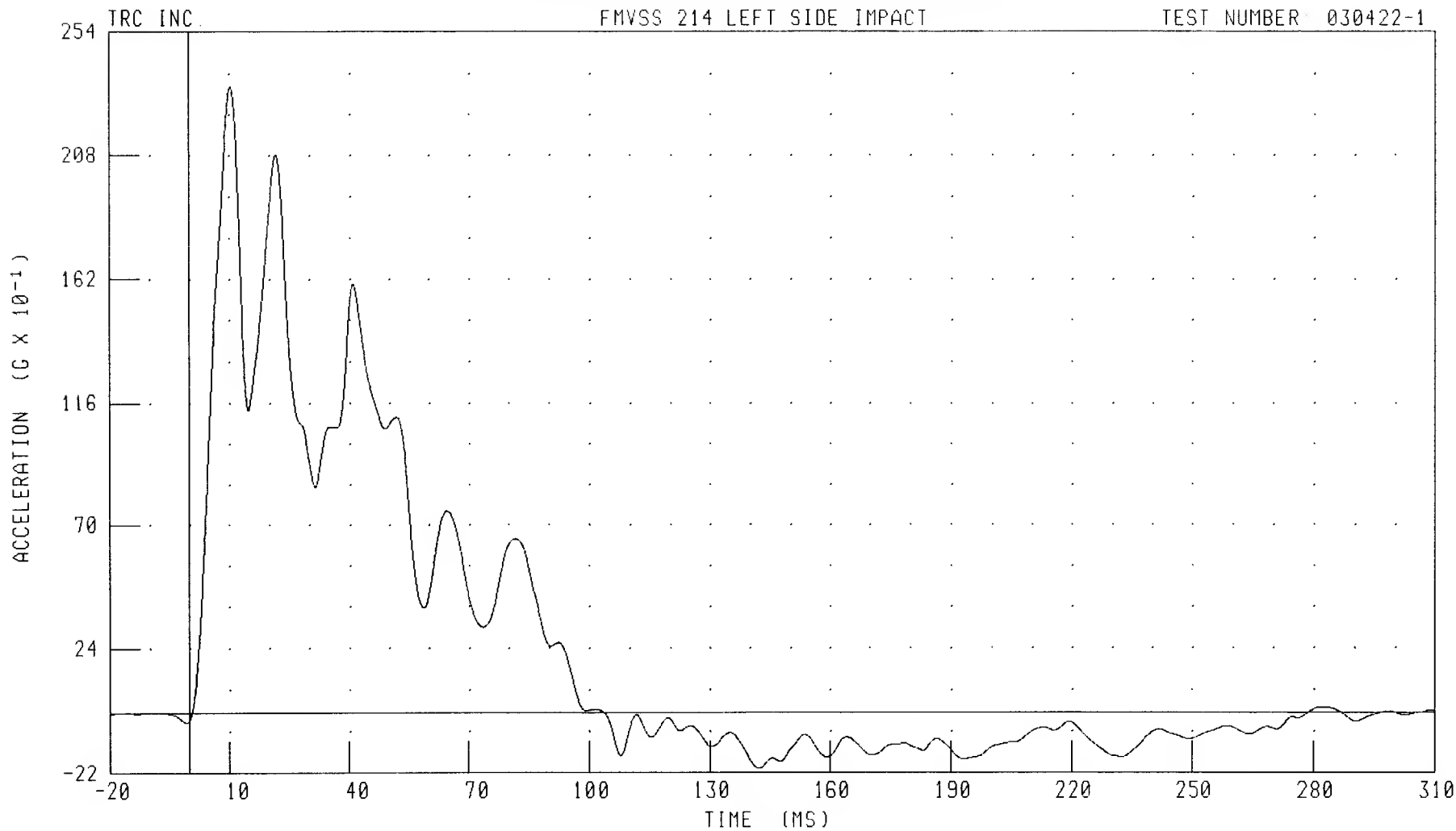
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

LEFT REAR SEAT TRACK Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



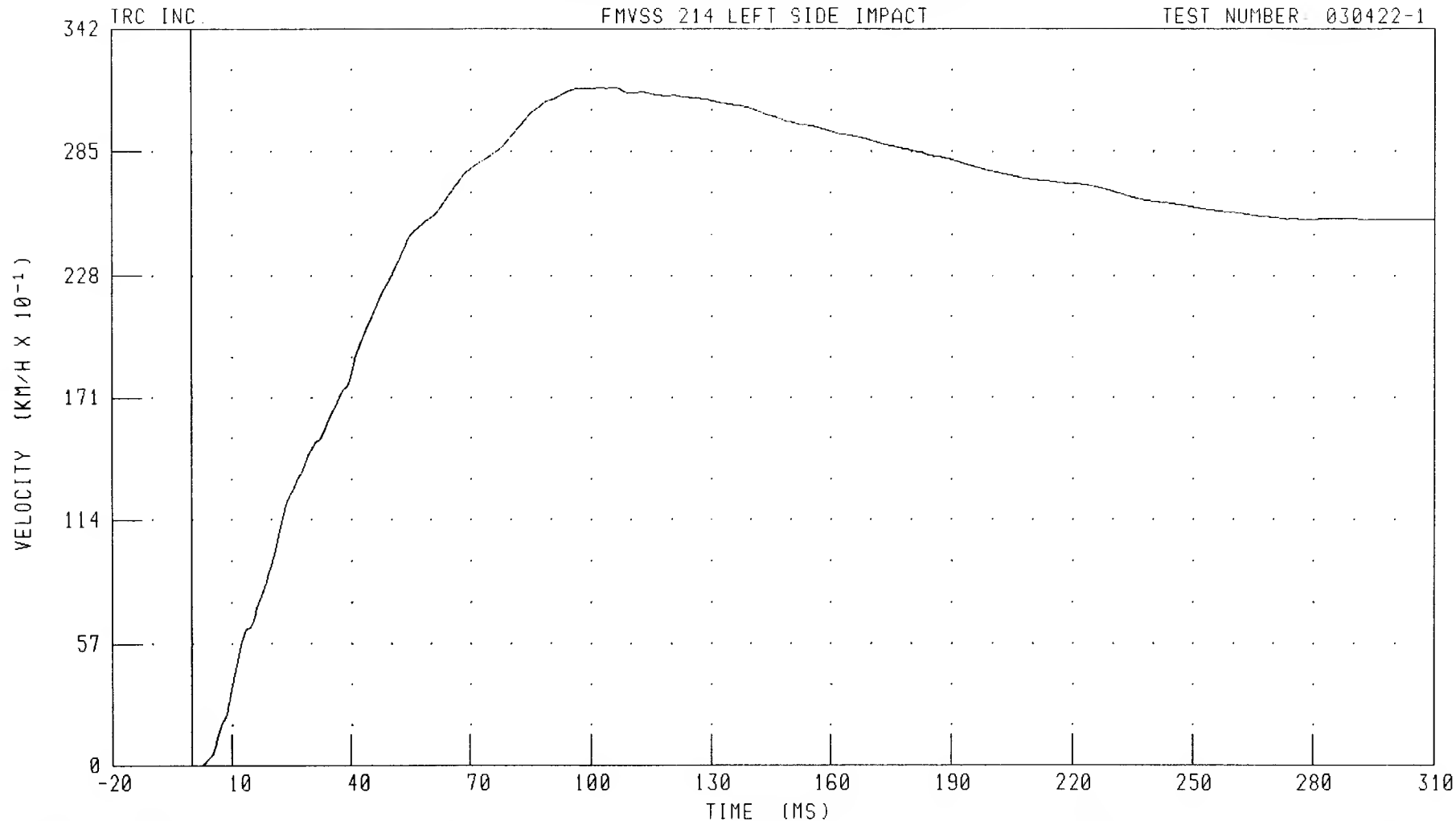
B-126

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT REAR SEAT TRACK Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: LRTYV1 FILTER: CH. CLASS 180

PEAK DATA: 31.46 KM/H @ 106 00 MS, -0 01 KM/H @ 2 08 MS

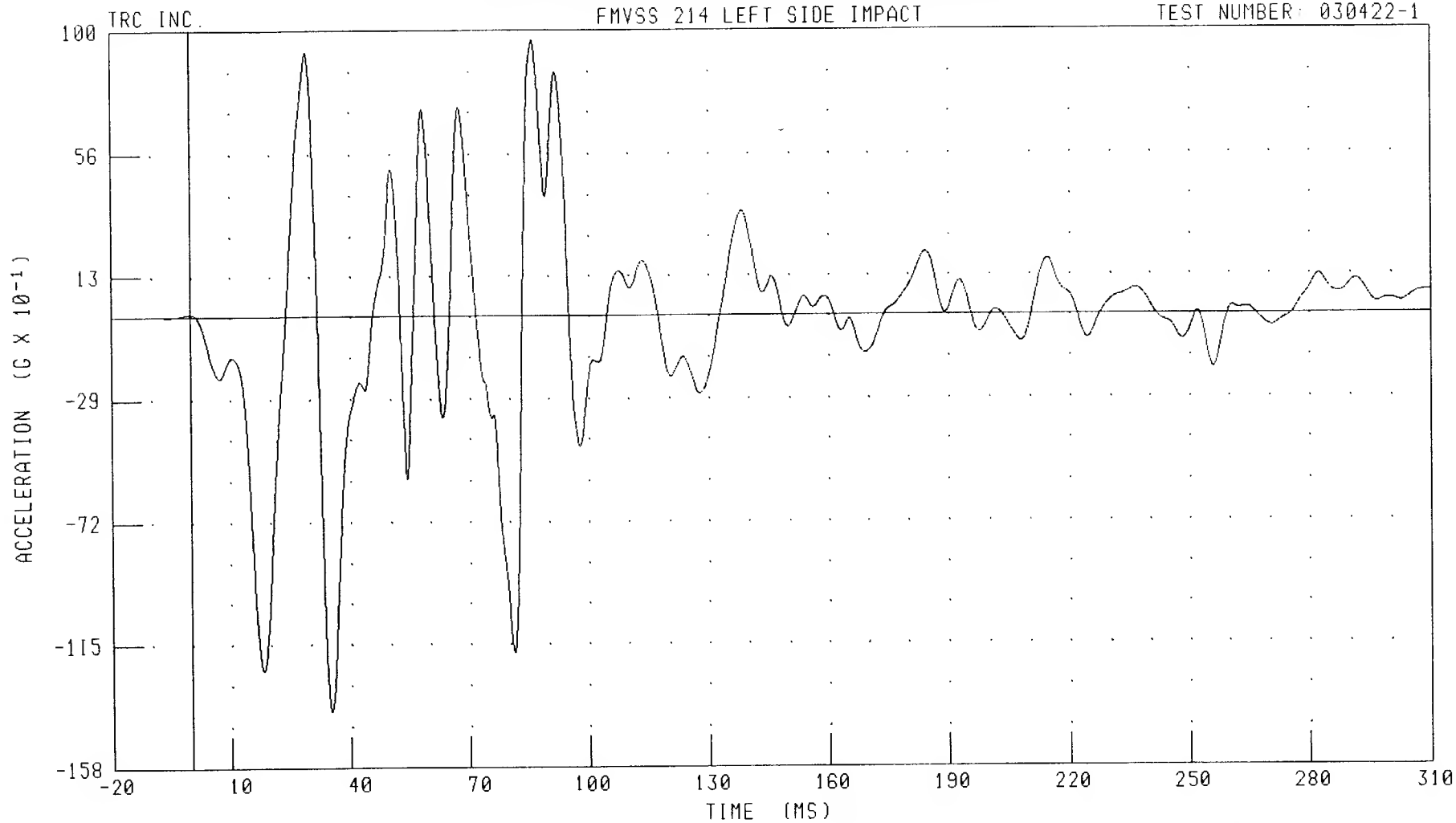
B-127

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
VEHICLE CENTER OF GRAVITY X-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



B-128

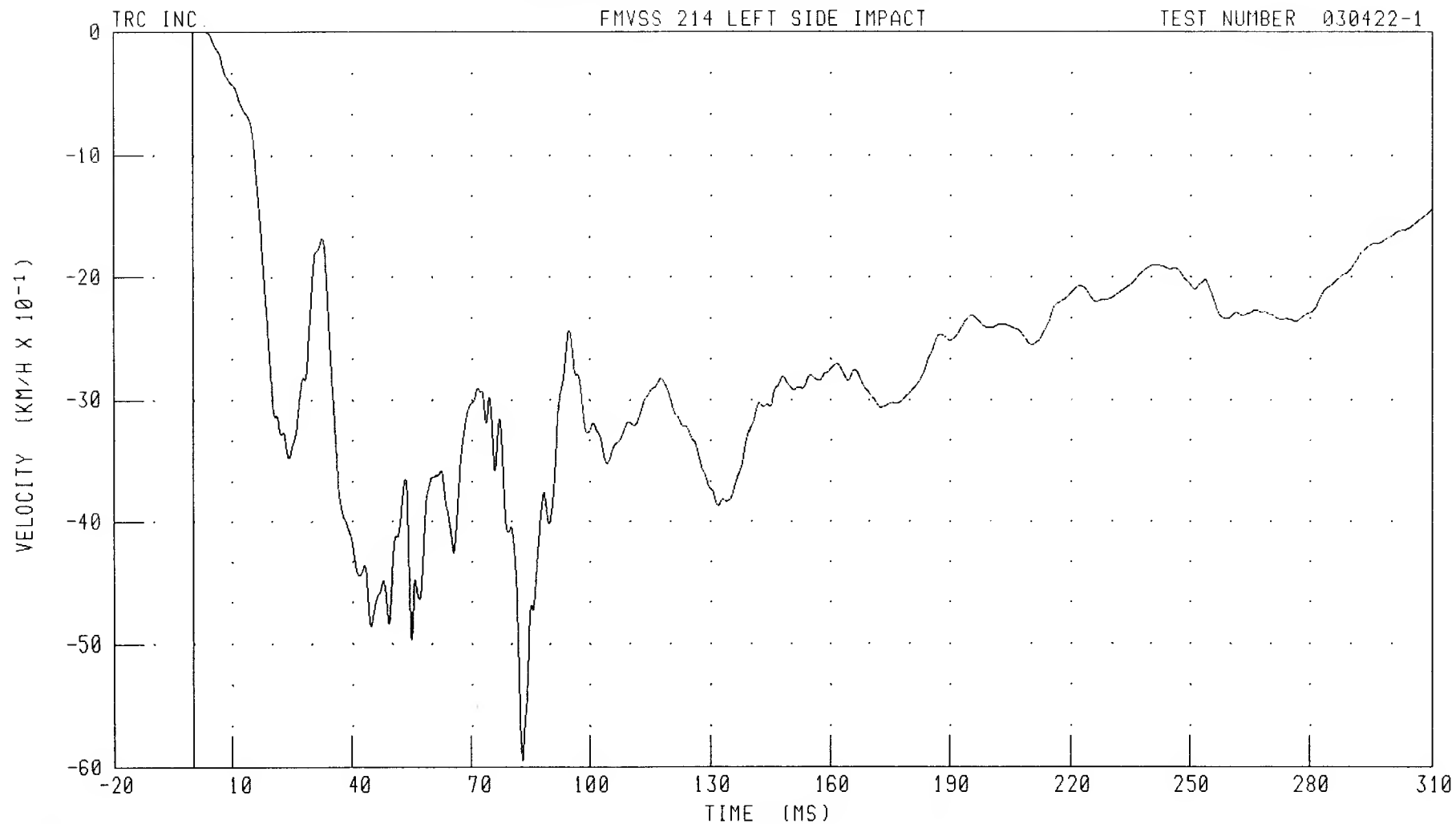
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

VEHICLE CENTER OF GRAVITY X-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL: VCGXV1 FILTER: CH. CLASS 180

PEAK DATA: 0 00 KM/H @ 2.48 MS; -5 95 KM/H @ 82 88 MS

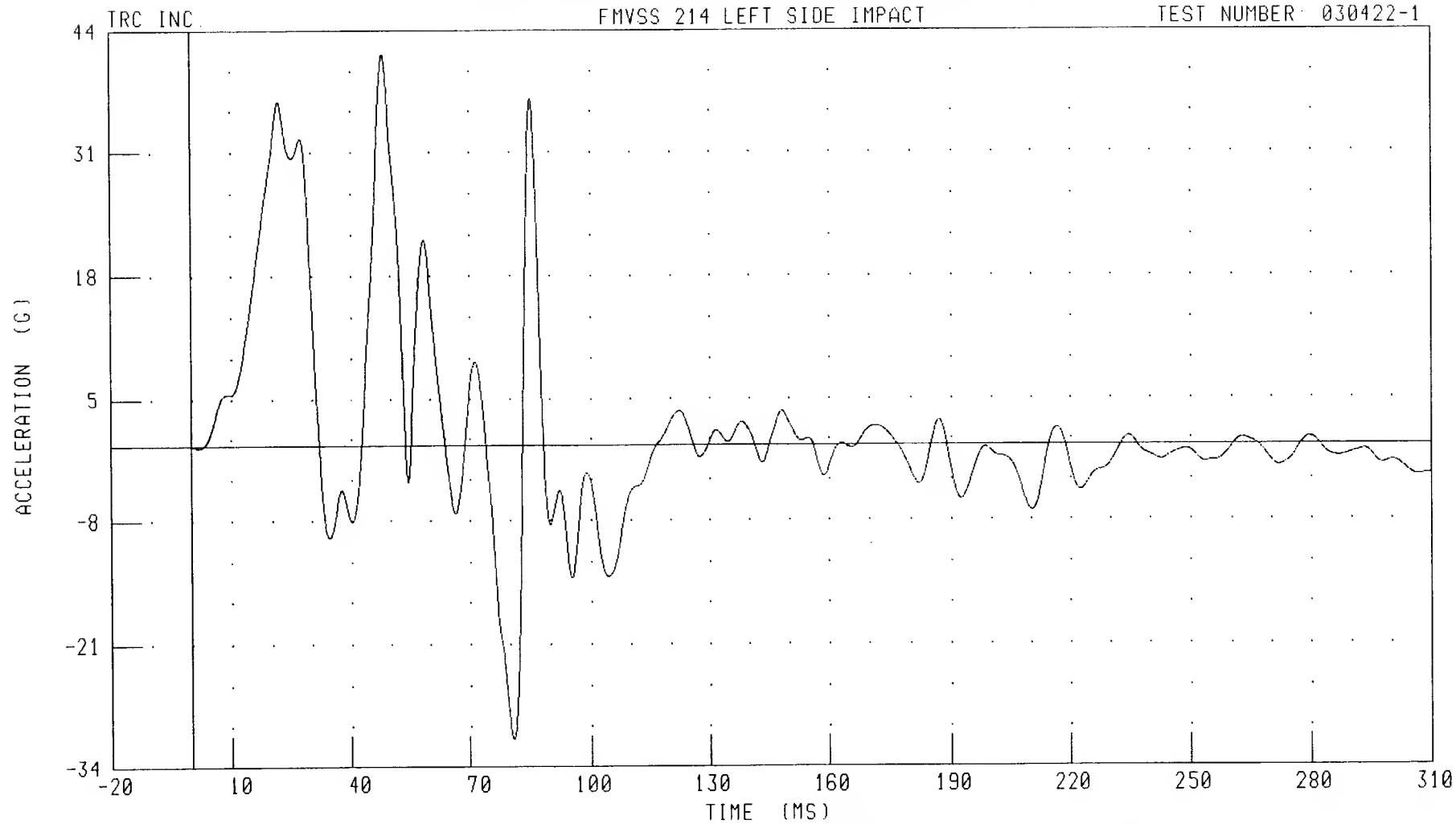
B-129

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
VEHICLE CENTER OF GRAVITY Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: VCGYG1 FILTER: CH CLASS 60

PEAK DATA: 41.50 G @ 48.32 MS; -31.04 G @ 80.88 MS

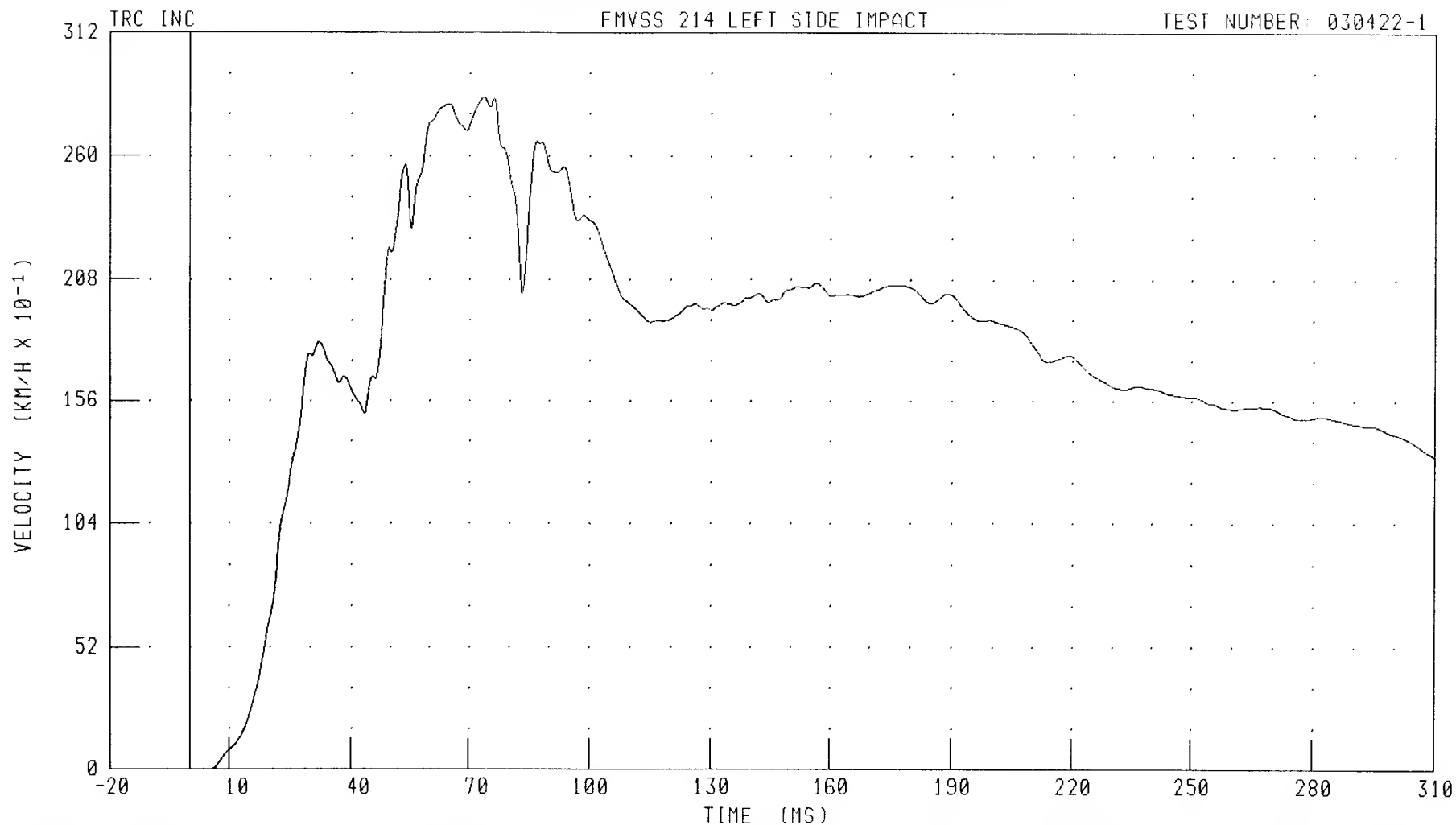
B-130

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
VEHICLE CENTER OF GRAVITY Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: VCGYV1 FILTER: CH. CLASS 180

PEAK DATA: 28.46 KM/H @ 73.68 MS; -0.01 KM/H @ 4.88 MS

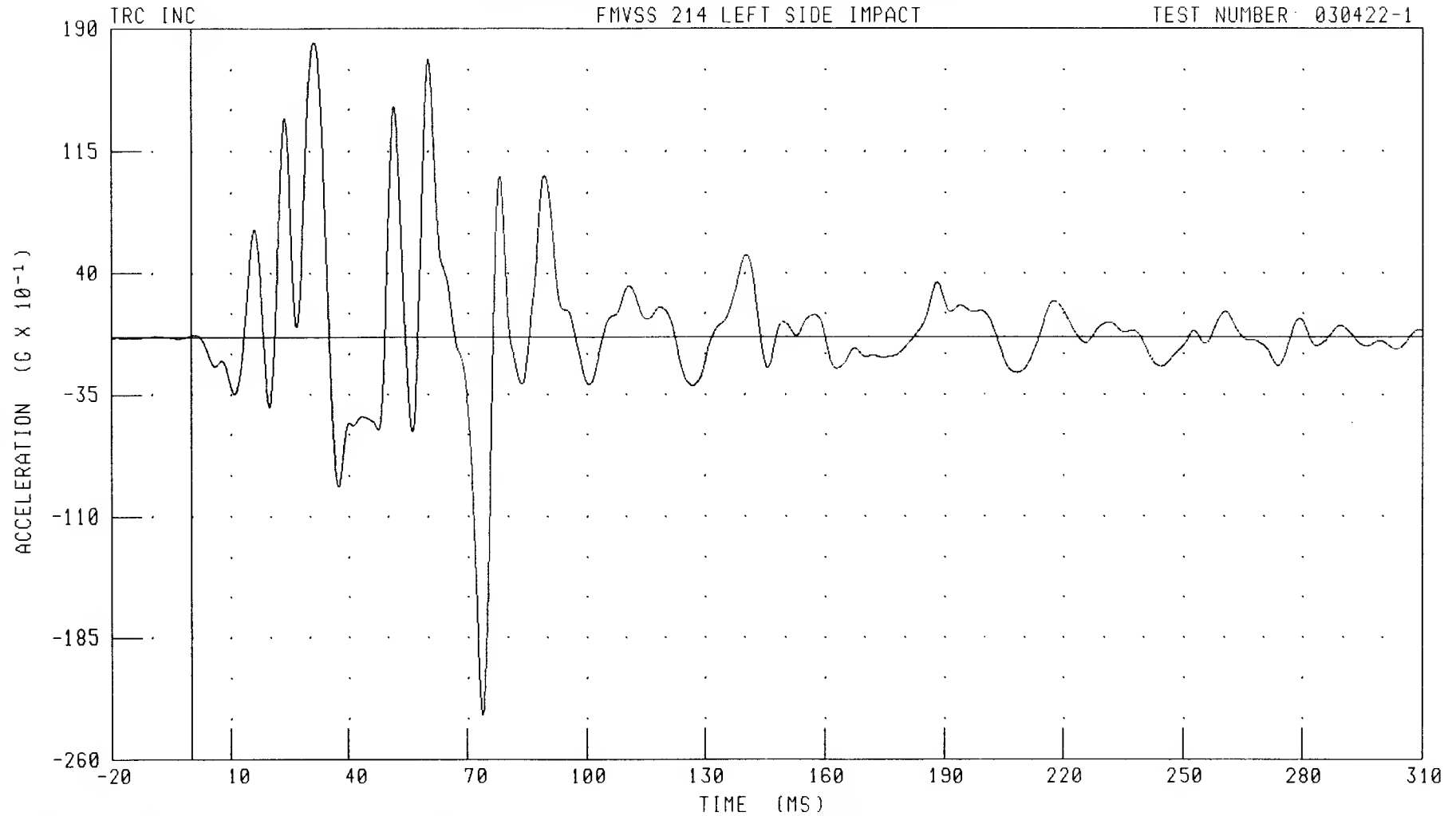
B-131

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
VEHICLE CENTER OF GRAVITY Z-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: VCCZG1 FILTER: CH CLASS 60

B-132

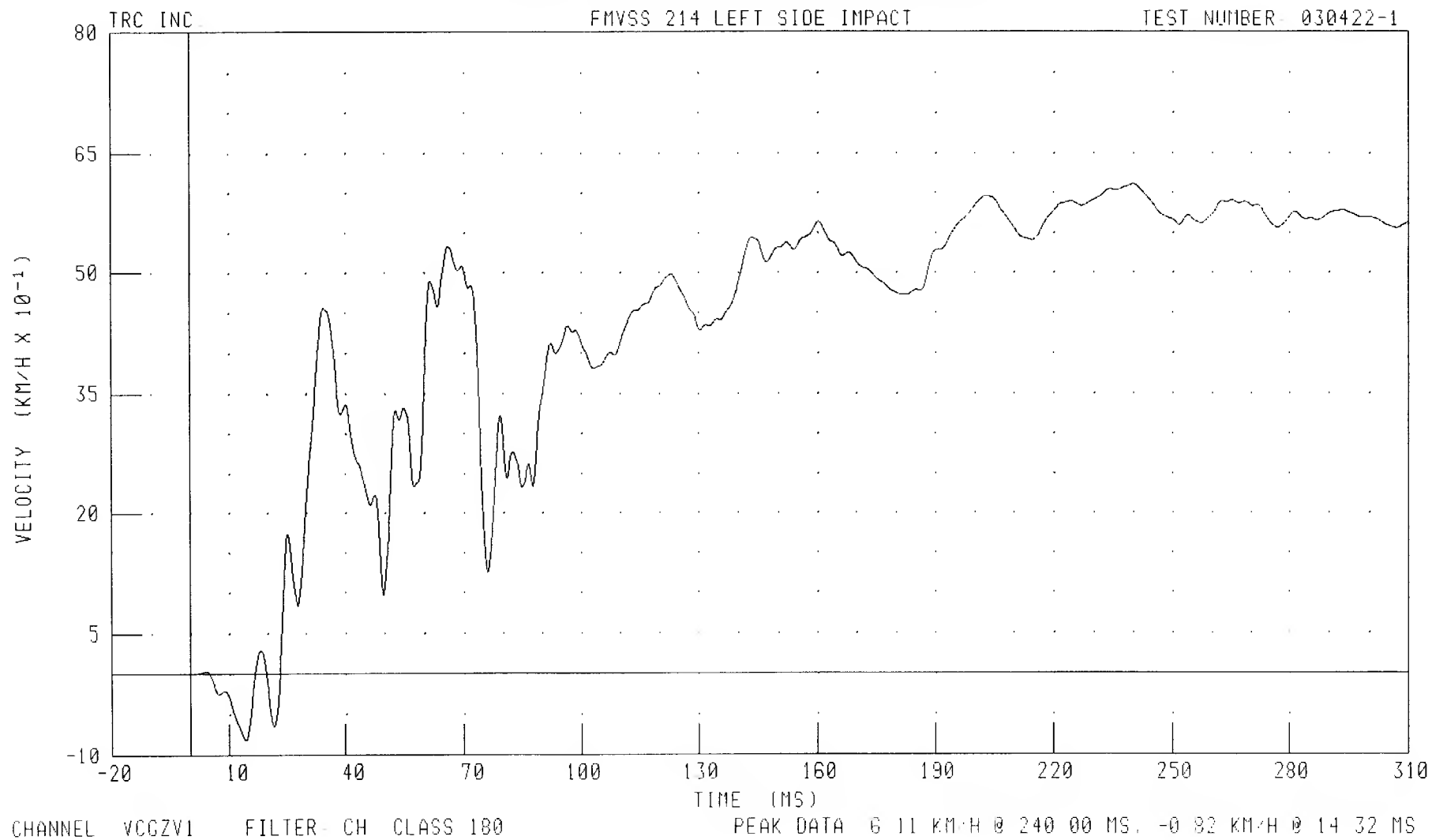
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

VEHICLE CENTER OF GRAVITY Z-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



B-133

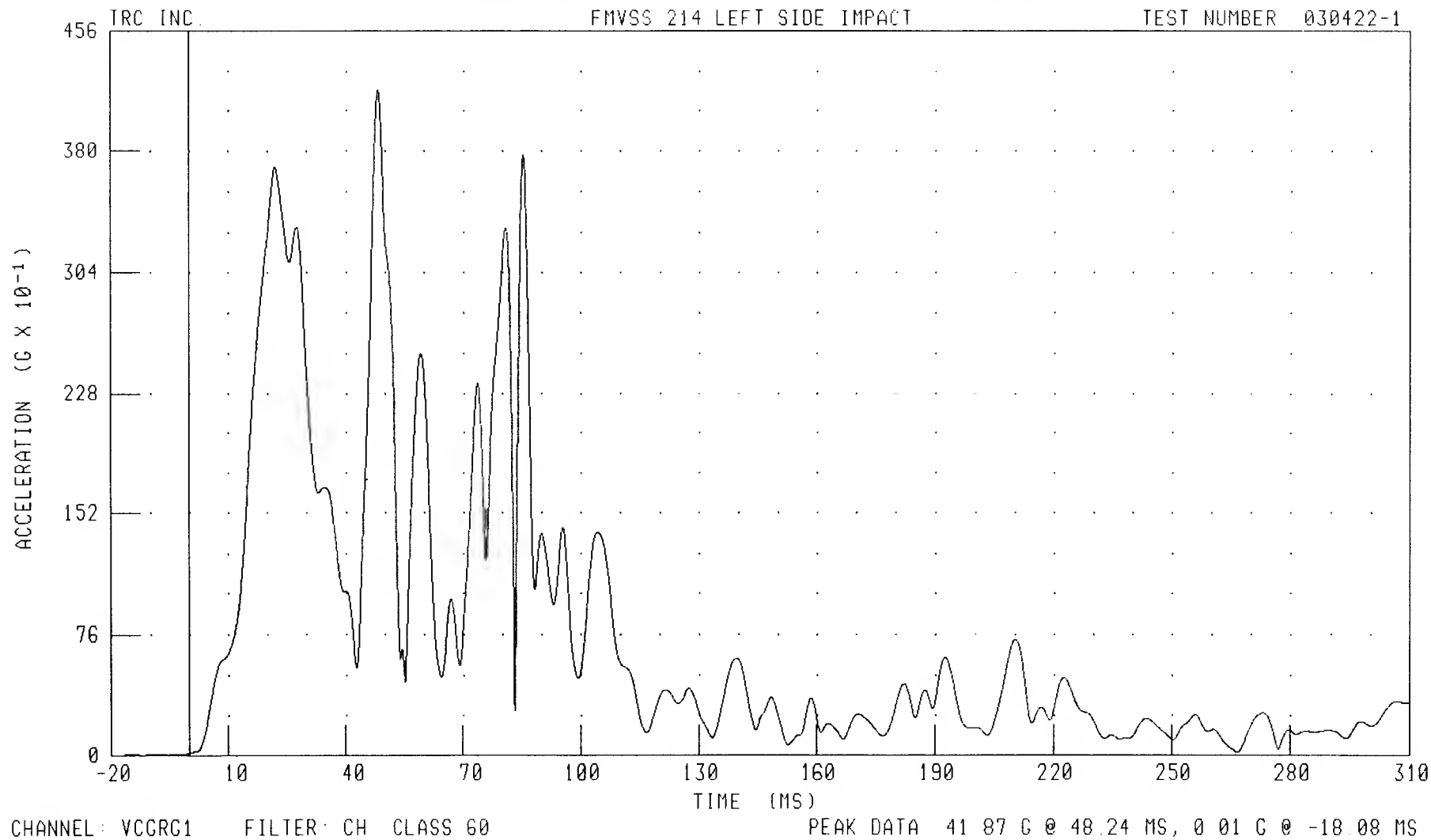
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

VEHICLE CENTER OF GRAVITY RESULTANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



B-134

030422-1

MDB Instrumentation Plots

Acceleration Data - Filter Class 60

Integration Data - Filter Class 180

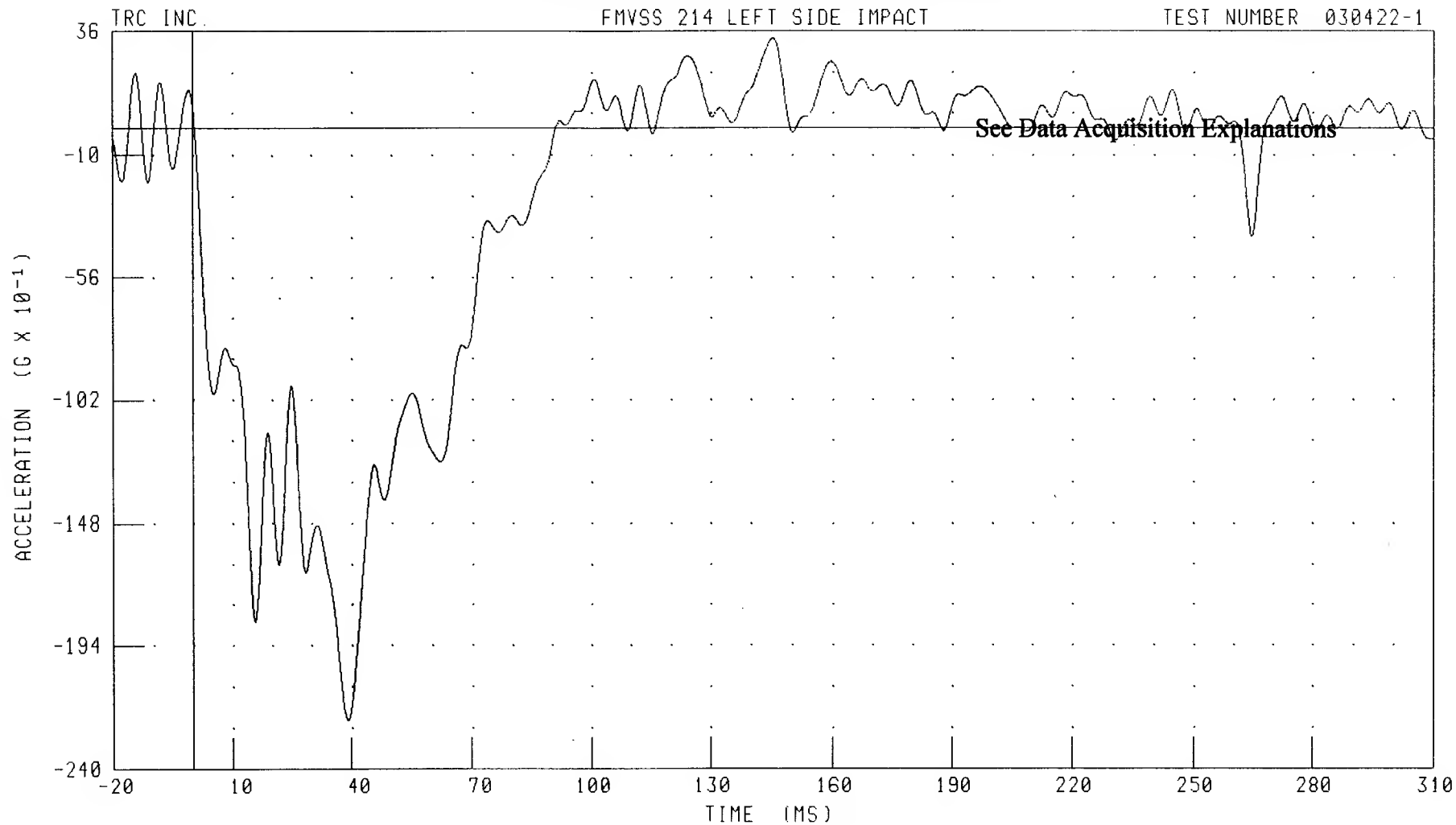
Contact Data - Filter Class 1000

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

MDB CENTER OF GRAVITY X-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL: BCGXG1 FILTER: CH. CLASS 60

PEAK DATA: 3.34 G @ 145.36 MS; -22.20 G @ 39.20 MS

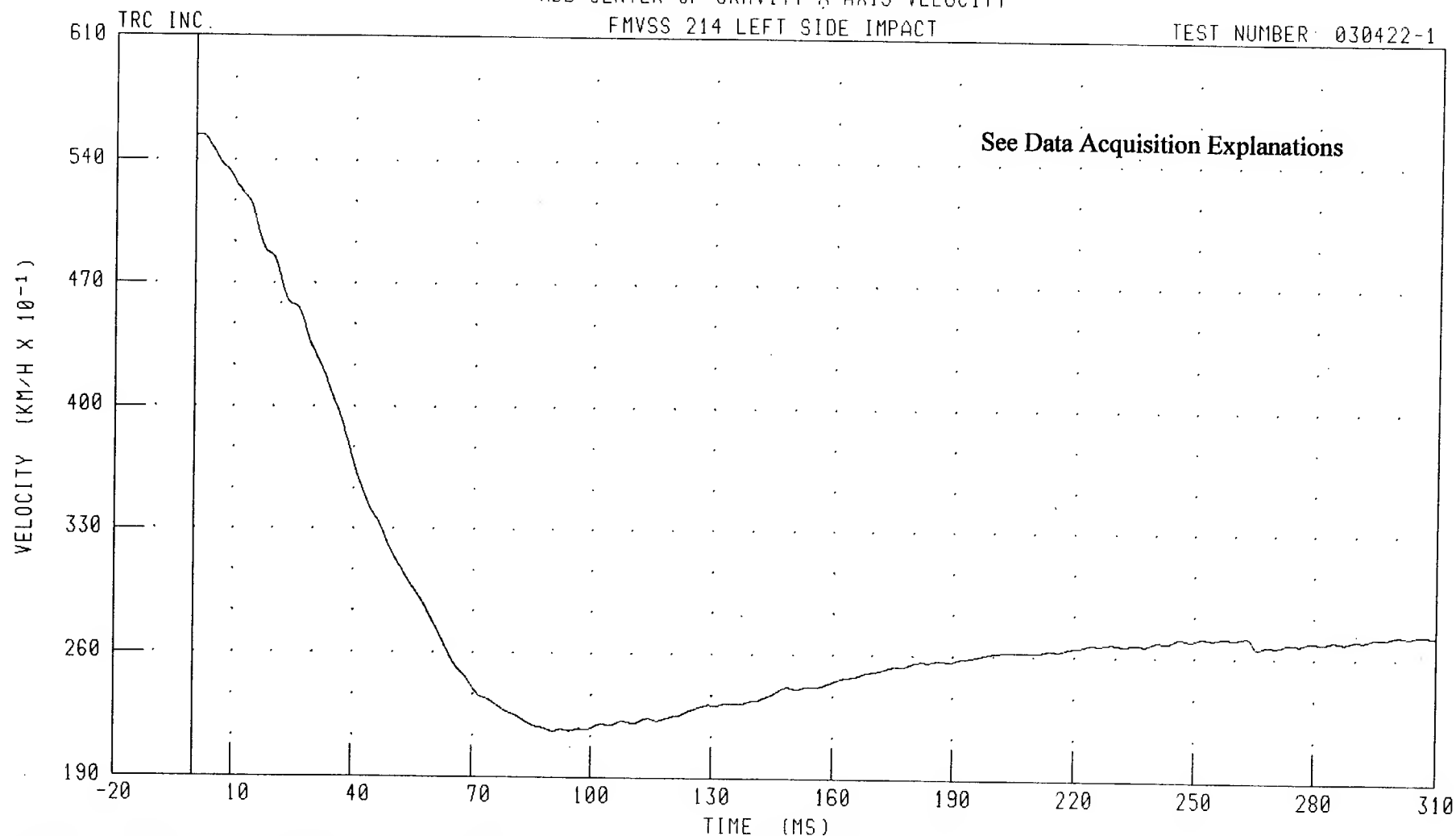
B-136

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
MDB CENTER OF GRAVITY X-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: BCGXV1 FILTER: CH CLASS 180

PEAK DATA: 55.47 KM/H @ 1.12 MS, 21.59 KM/H @ 90.24 MS

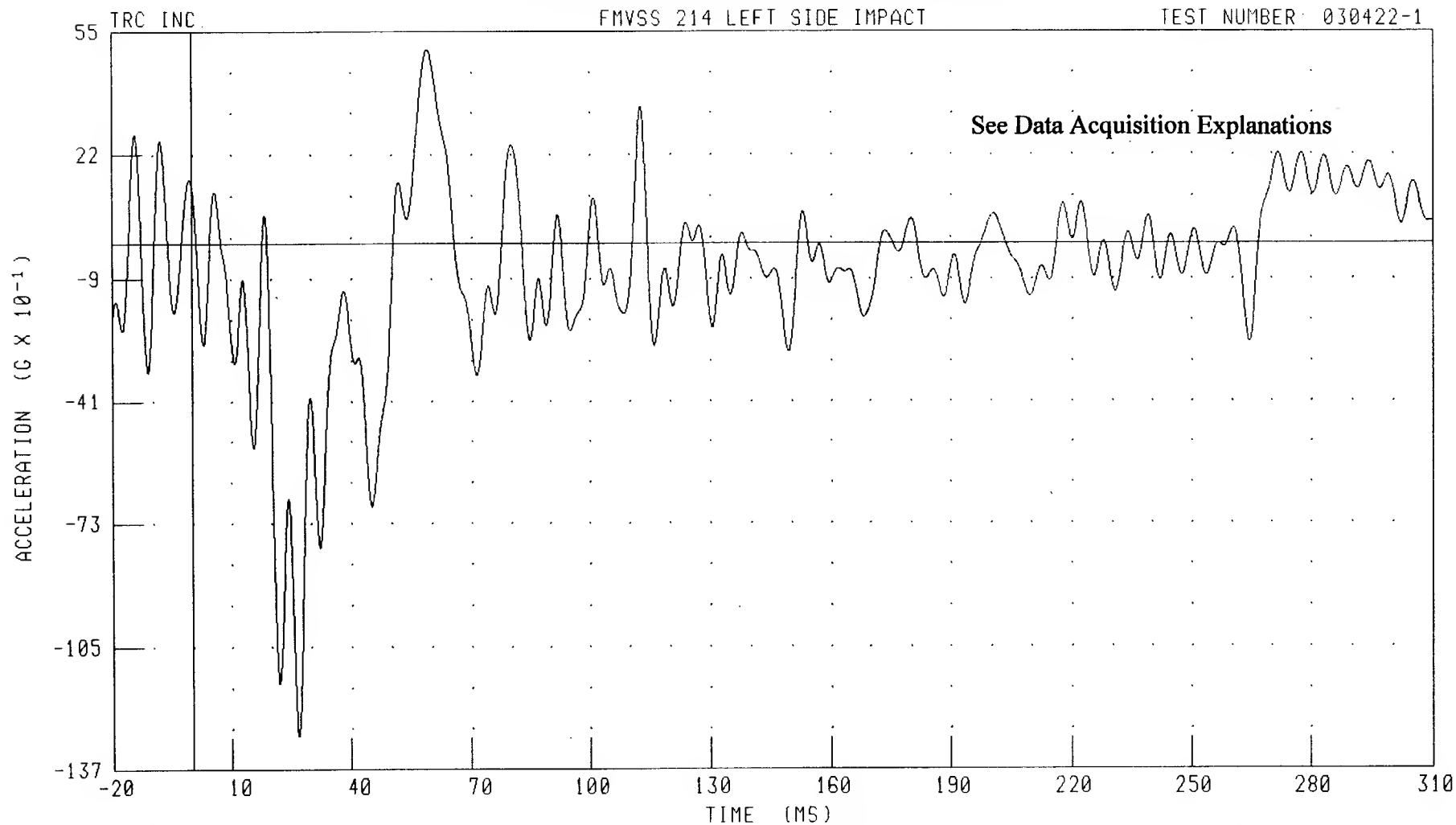
B-137

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
MDB CENTER OF GRAVITY Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL: BCGYG1 FILTER: CH CLASS 60

PEAK DATA 5.03 G @ 58.96 MS, -12.84 G @ 26.80 MS

B-138

030422-1

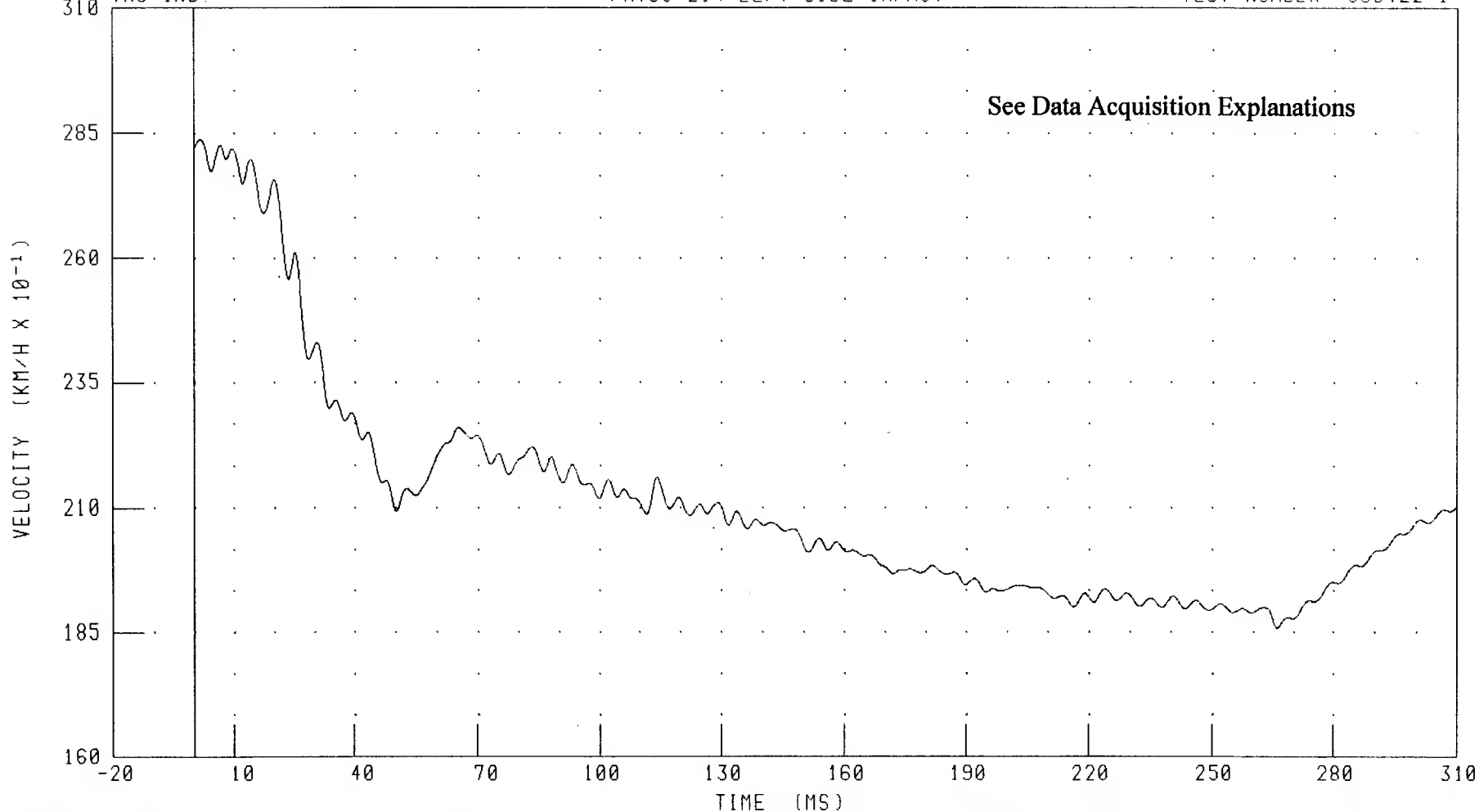
55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
MDB CENTER OF GRAVITY Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1

TRC INC.

See Data Acquisition Explanations



CHANNEL: BCGYV1 FILTER: CH. CLASS 180

PEAK DATA: 28 38 KM/H @ 1.60 MS; 18 58 KM/H @ 266 00 MS

B-139

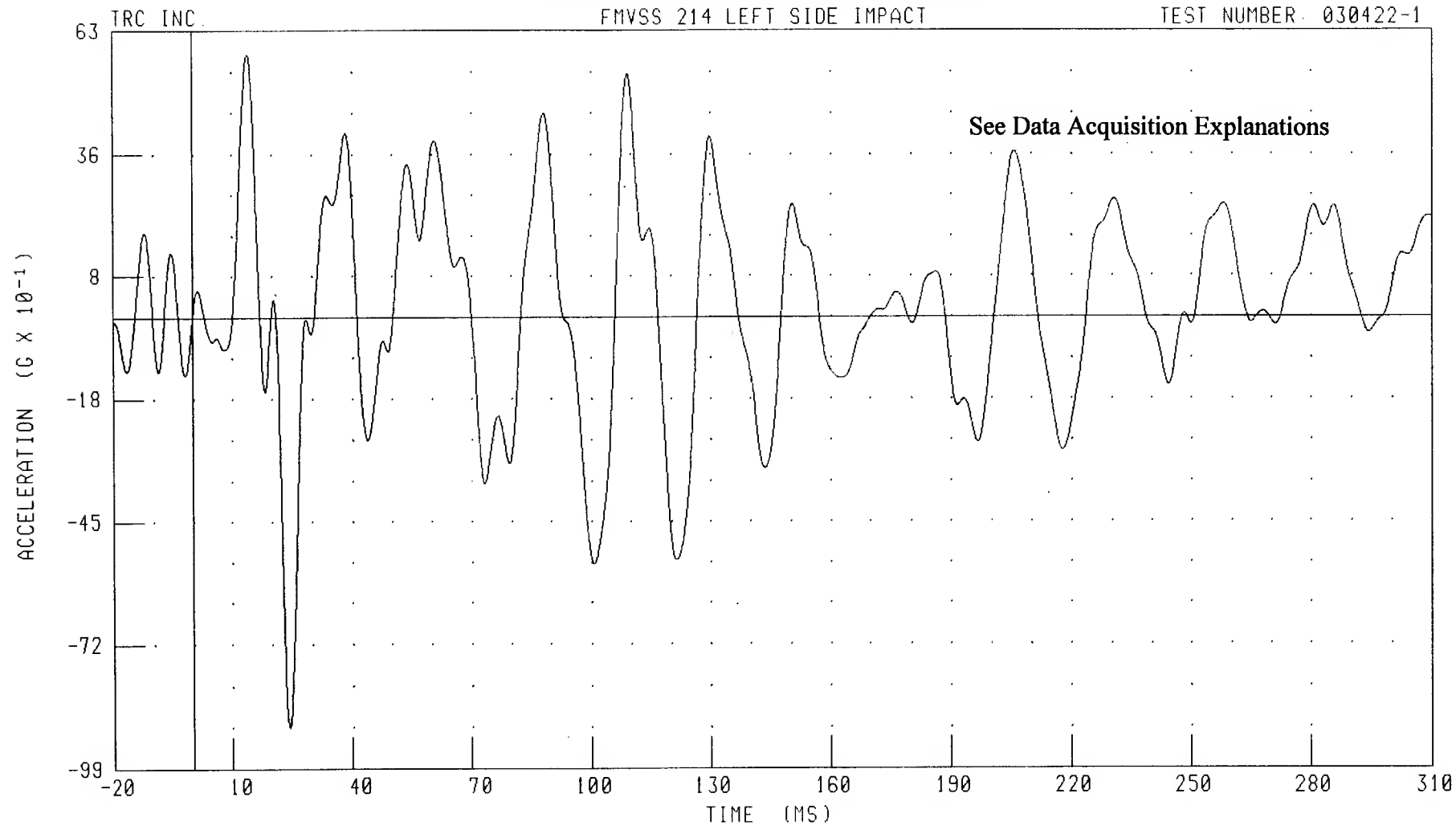
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

MOB CENTER OF GRAVITY Z-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: BCGZC1 FILTER: CH CLASS 60

PEAK DATA: 5.79 G @ 14.16 MS; -9.01 G @ 24.32 MS

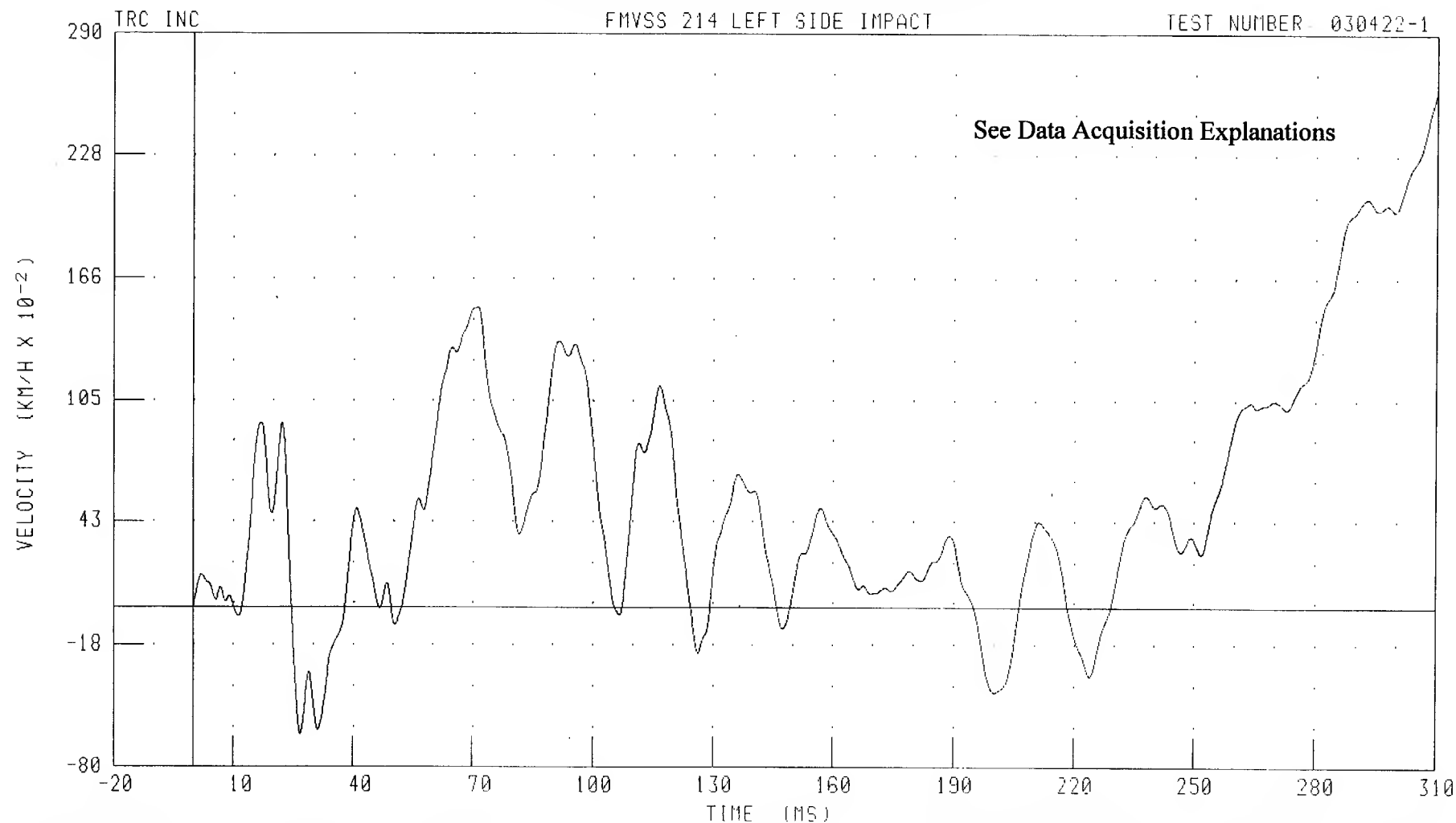
B-140

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
NDB CENTER OF GRAVITY Z-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL BCGZV1

FILTER CH CLASS 180

PEAK DATA 2 61 KM/H @ 310 00 MS, -0 63 KM/H @ 26 72 MS

B-141

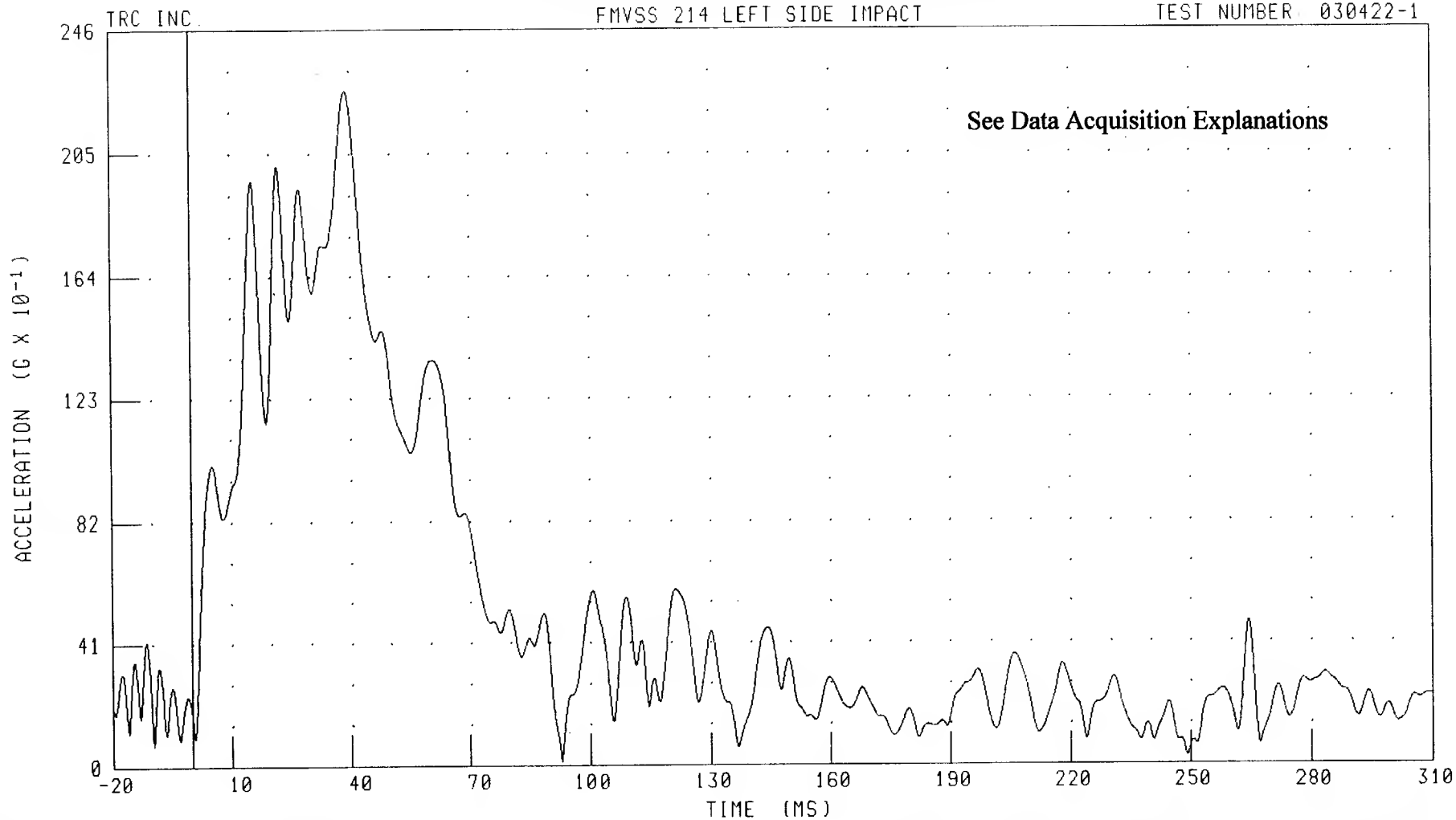
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
MDB CENTER OF GRAVITY RESULTANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1

See Data Acquisition Explanations



CHANNEL: BCCRG1

FILTER: CH. CLASS 60

PEAK DATA: 22.58 G @ 39.12 MS; 0.14 G @ 92.96 MS

B-142

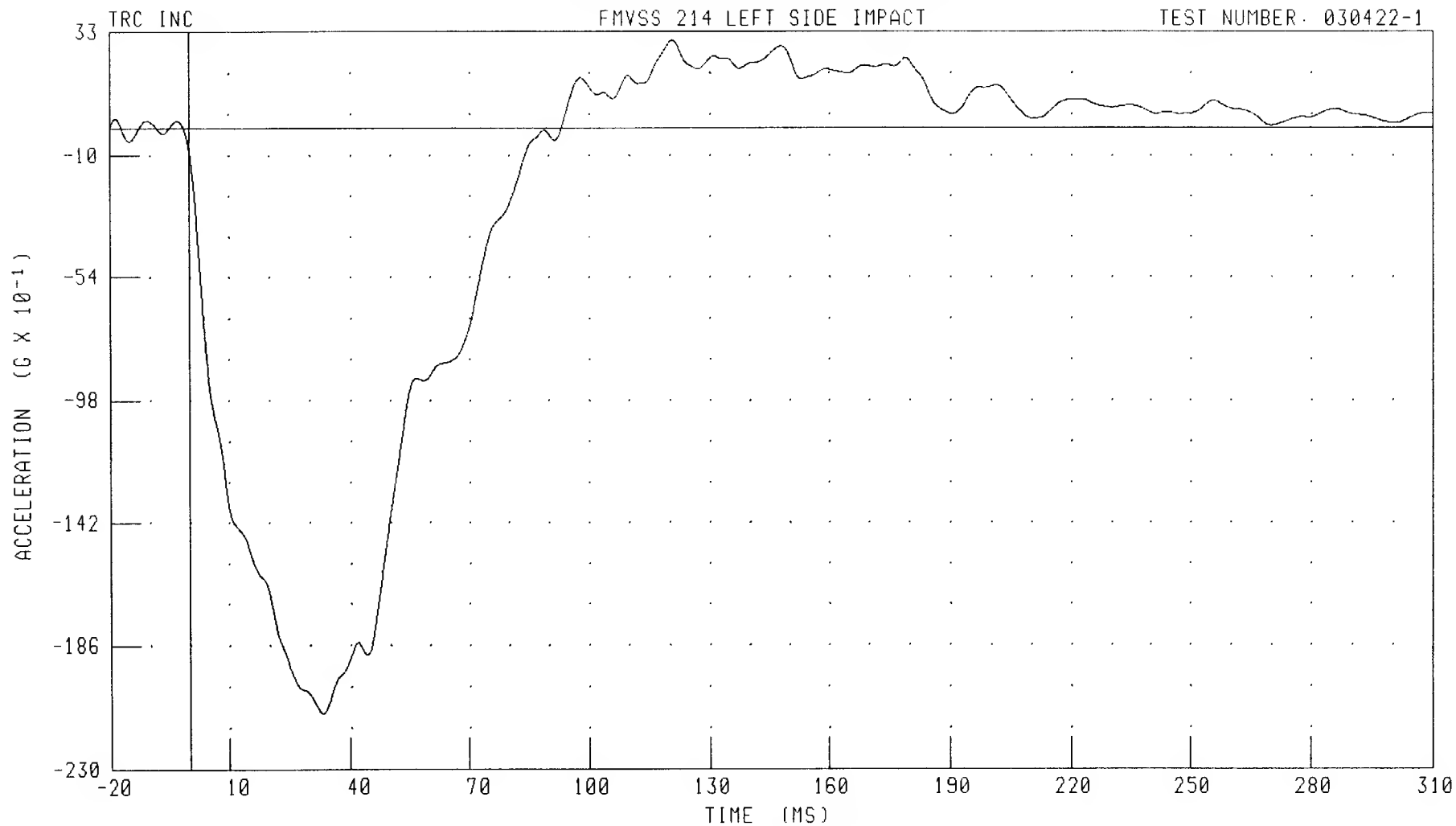
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

MOB LEFT REAR X-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: LRRXG1 FILTER: CH CLASS 60

PEAK DATA: 3 09 G @ 120 72 MS; -21 02 G @ 33 20 MS

B-143

030422-1

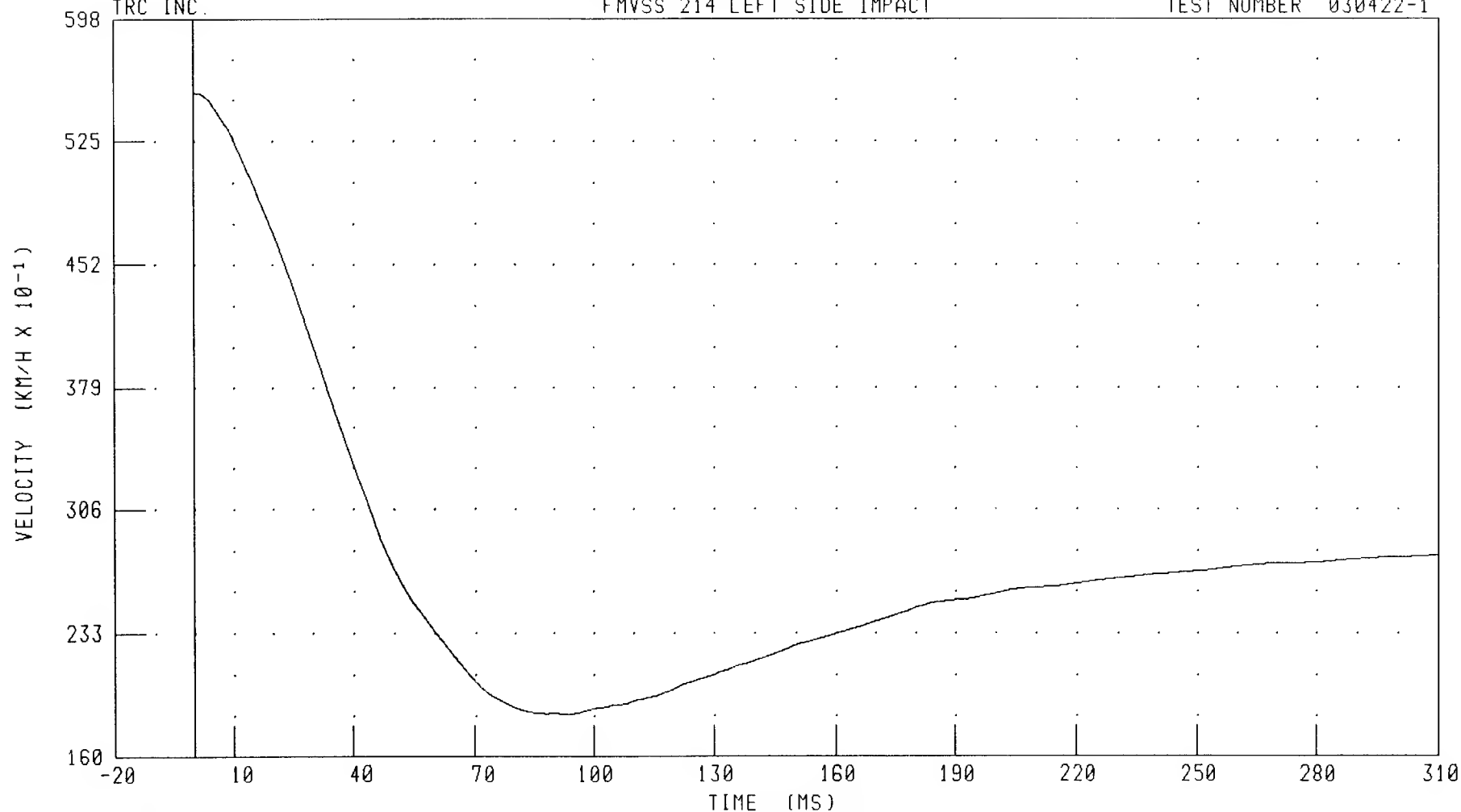
55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

MDB LEFT REAR X-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1

TRC INC.



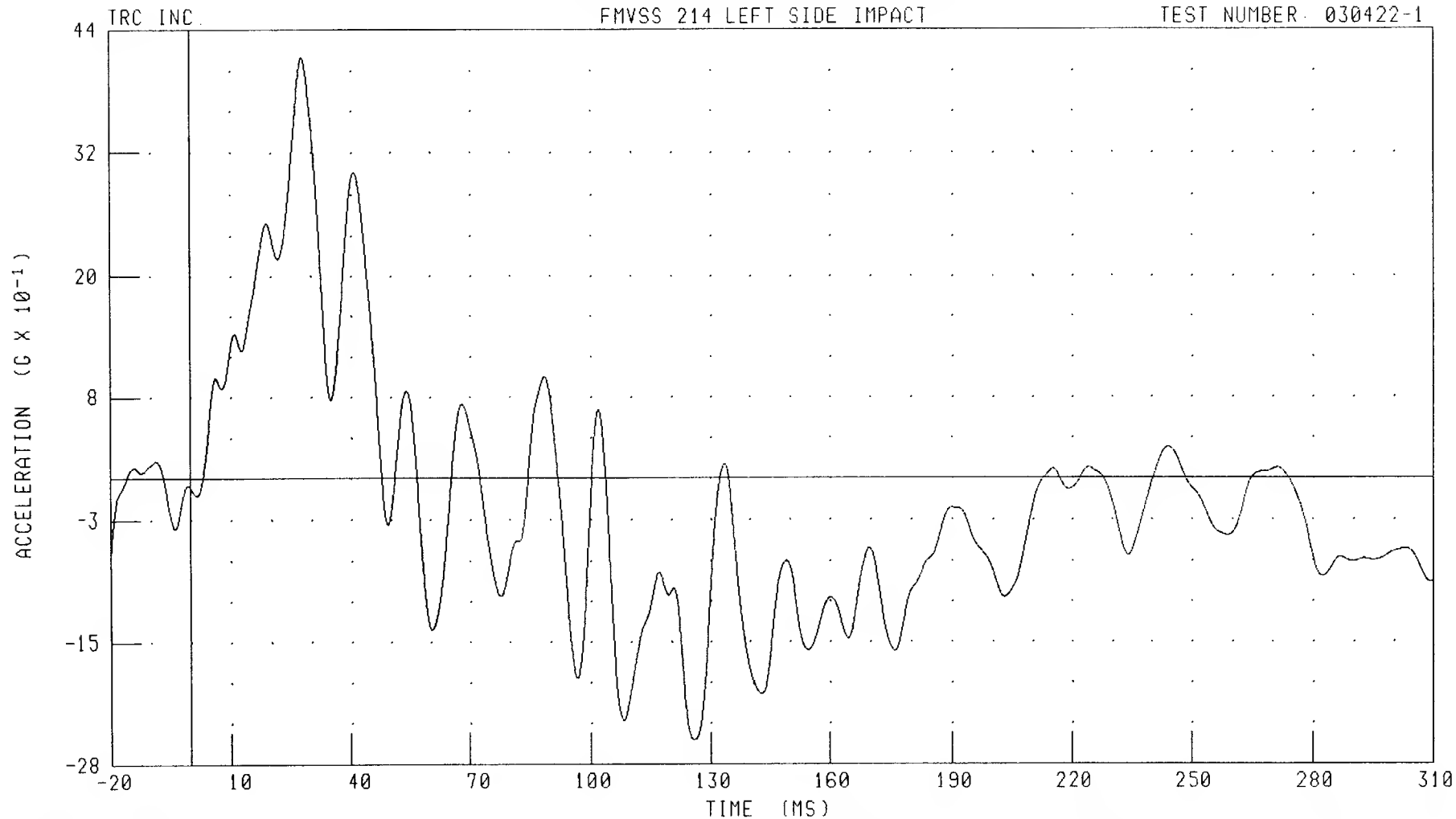
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

MOB LEFT REAR Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: LRRYG1

FILTER: CH CLASS 60

PEAK DATA 4.13 G @ 27.84 MS; -2.56 G @ 125.76 MS

B-145

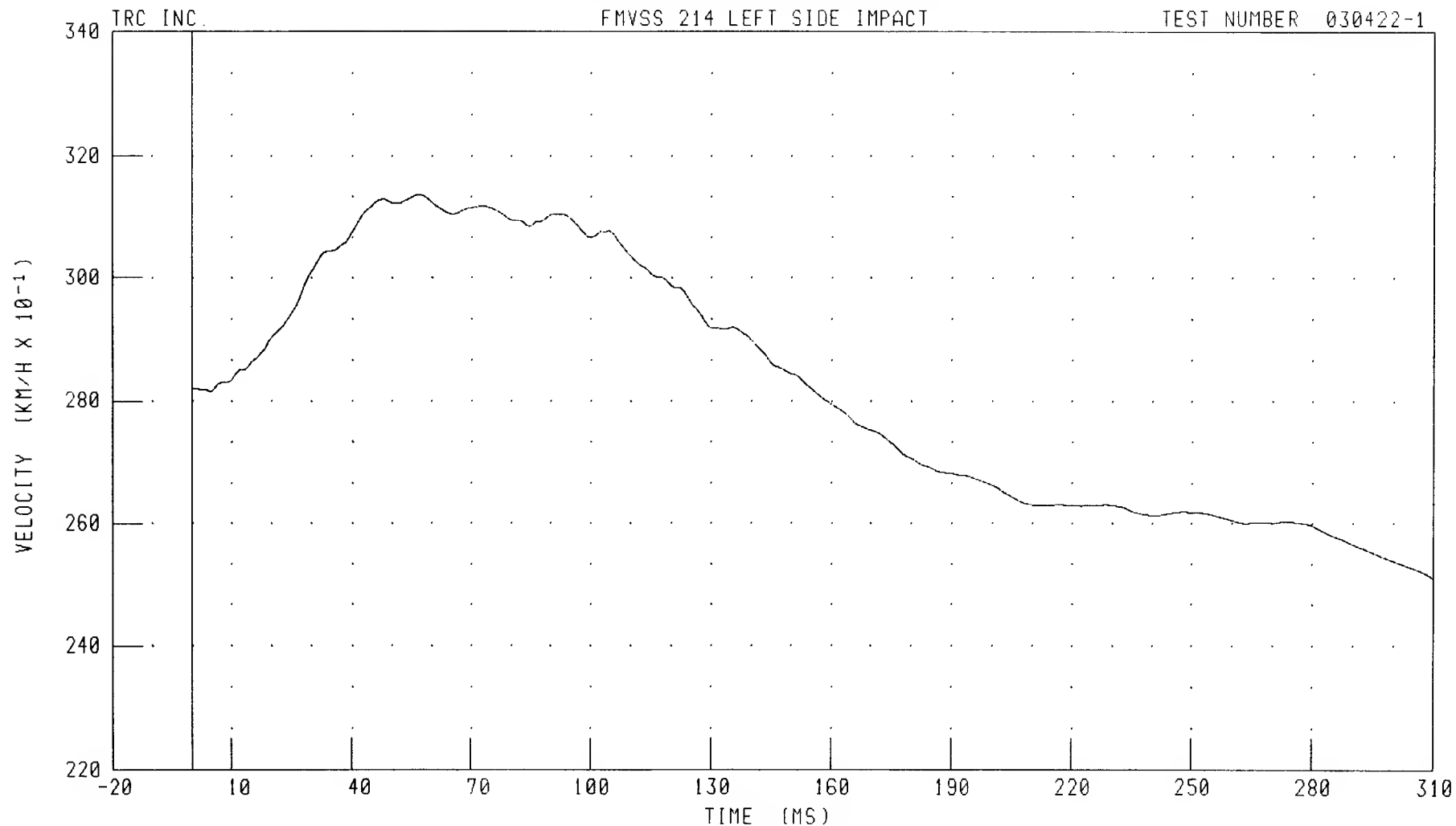
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

MOB LEFT REAR Y-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL: LRRYV1 FILTER: CH. CLASS 180

PEAK DATA 31 36 KM/H @ 56 88 MS; 25.09 KM/H @ 310 00 MS

B-146

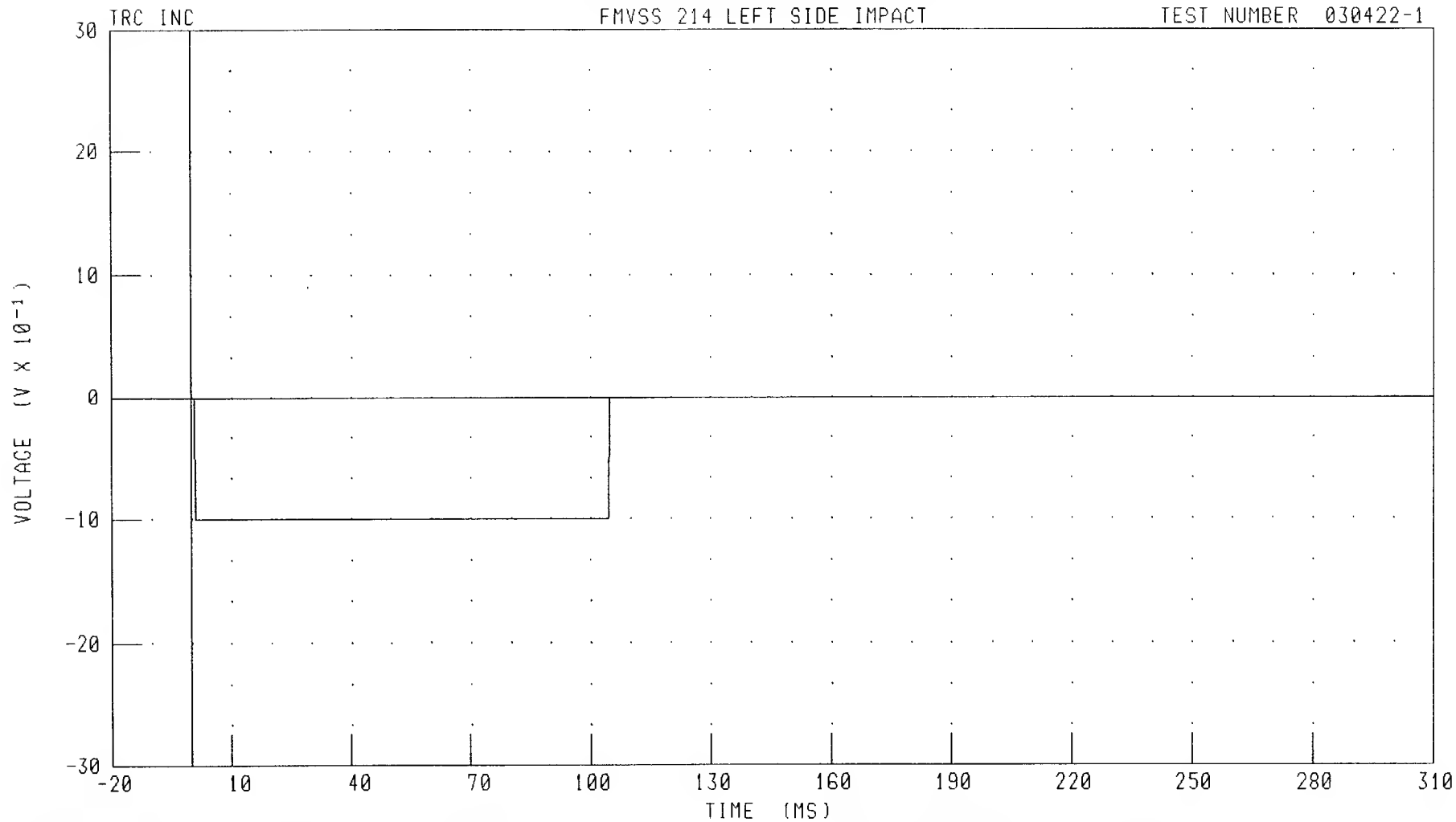
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

MDB RIGHT SIDE CONTACT SWITCH

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL: MDR1

FILTER: CH. CLASS 1000

PEAK DATA 0.00 V @ 310.00 MS; -1.00 V @ 0.96 MS

B-147

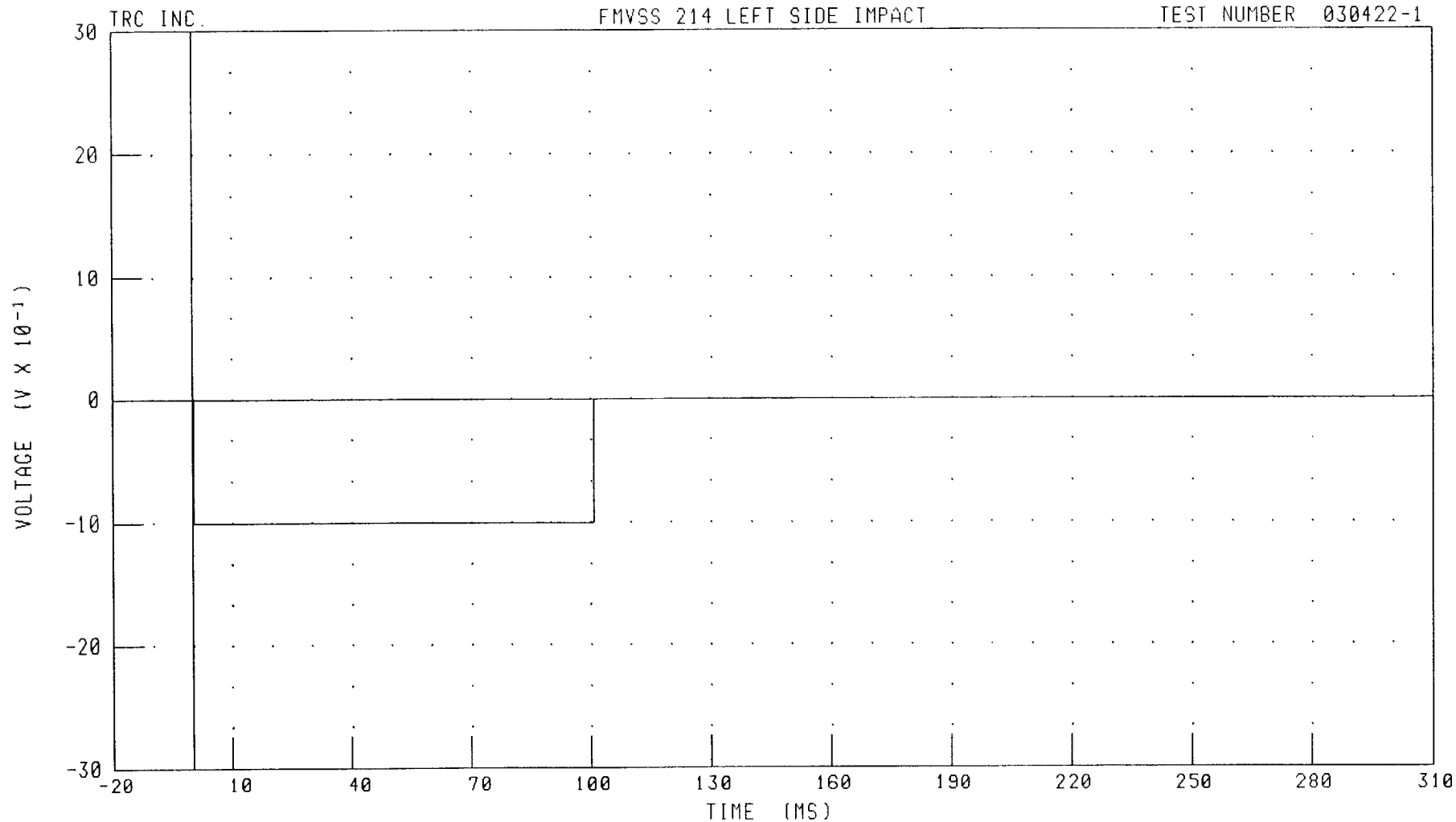
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

MDB LEFT SIDE CONTACT SWITCH

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL: MDBL1

FILTER: CH. CLASS 1000

PEAK DATA: 0.00 V @ 310.00 MS; -1.00 V @ 0.32 MS

B-148

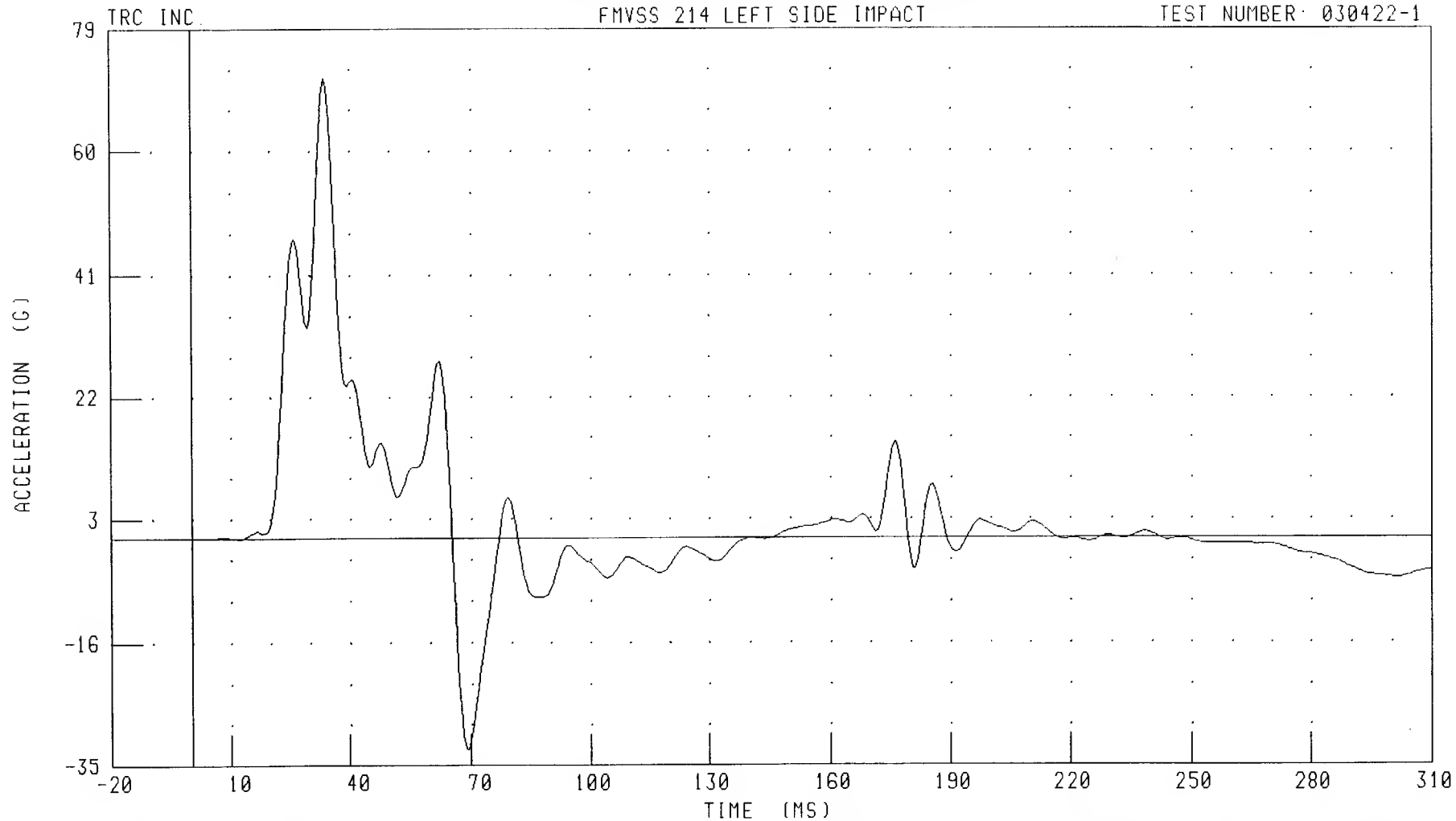
030422-1

Driver and Passenger Dummy Instrumentation Plots
Acceleration Data - FIR Filtered

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
DRIVER UPPER RIB Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: LURYG1 FILTER: FIR 100

PEAK DATA: 71.24 G @ 33.75 MS; -32.58 G @ 69.38 MS

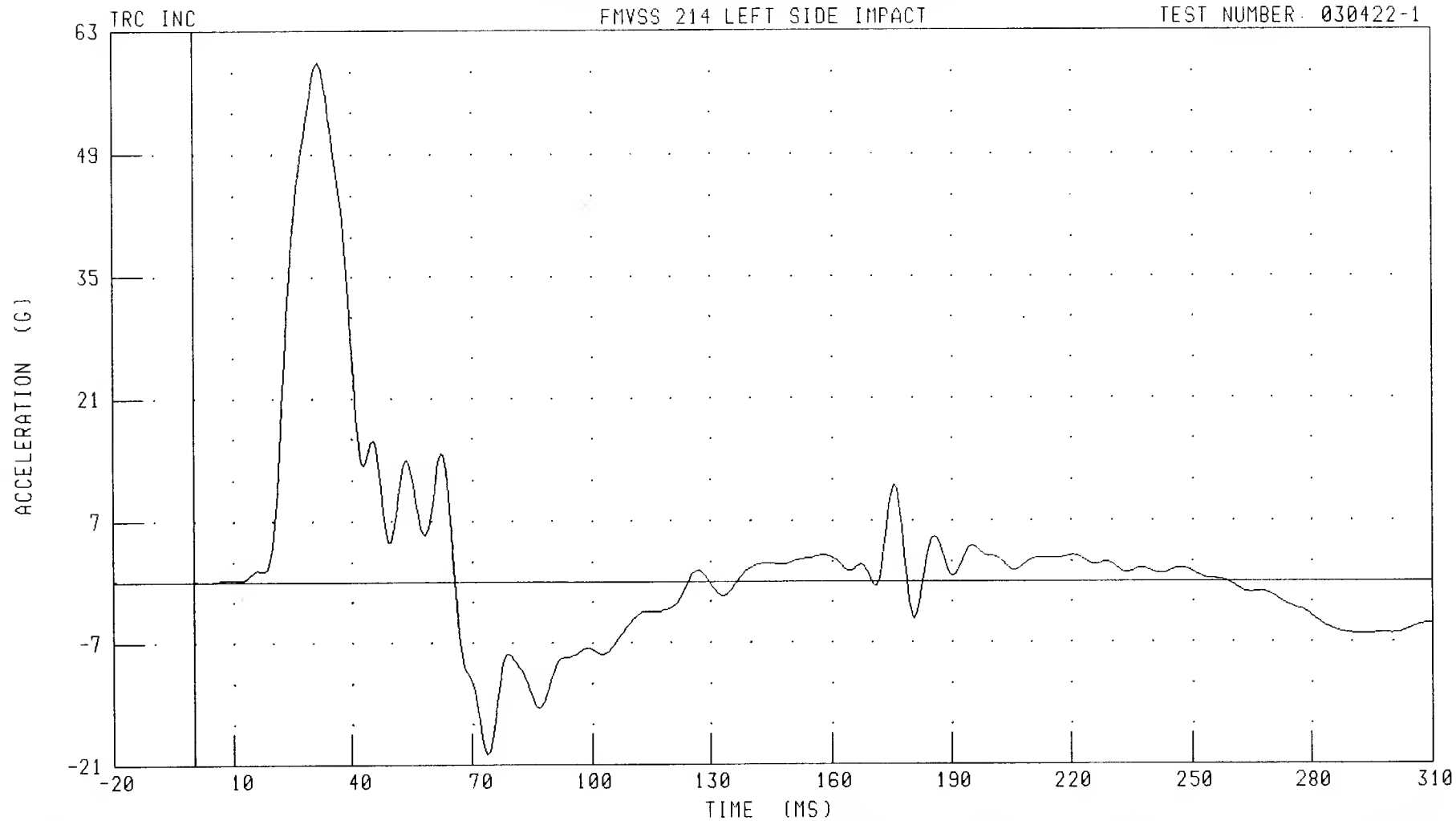
B-150

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
DRIVER LOWER RIB Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: LLRYG1 FILTER: FIR 100

PEAK DATA: 59.42 G @ 31.88 MS; -19.83 G @ 73.75 MS

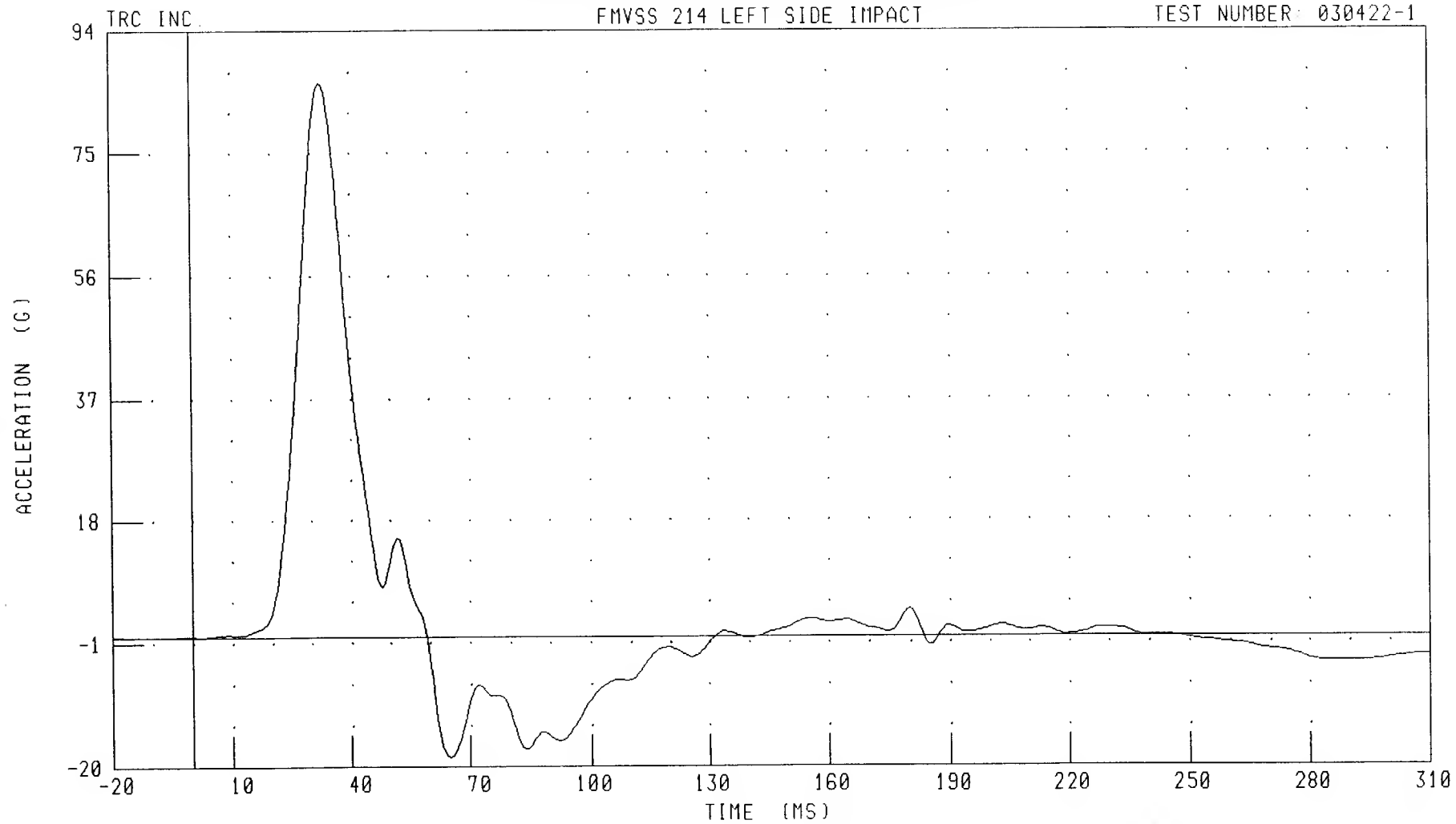
B-151

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
DRIVER LOWER SPINE Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: T12YC1 FILTER: FIR 100

PEAK DATA: 86.06 G @ 32.50 MS, -18.57 G @ 65.00 MS

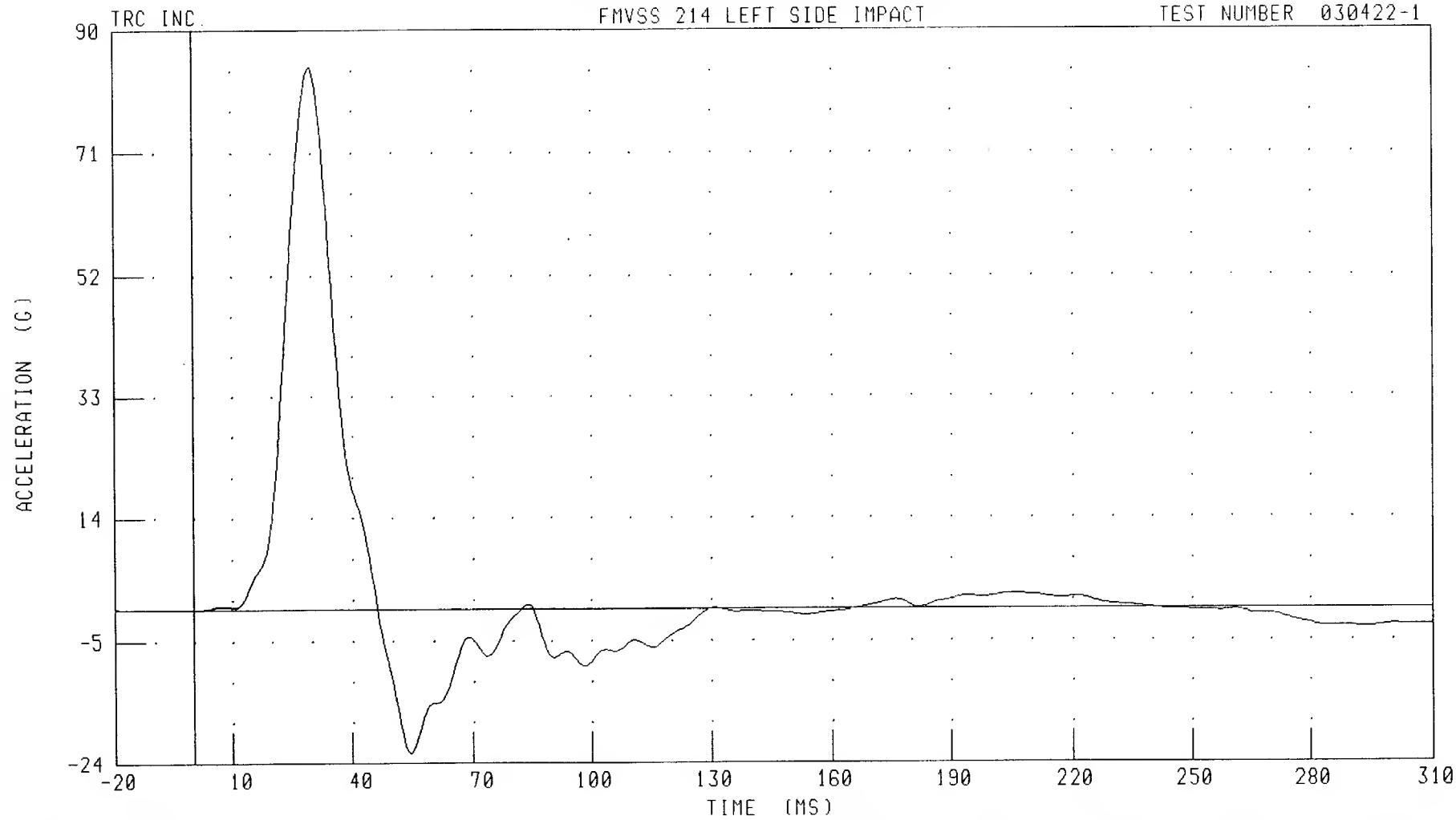
B-152

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
DRIVER PELVIS Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL: PEVYG1 FILTER: FIR 100

PEAK DATA 84.26 G @ 30.00 MS; -22.62 G @ 54.38 MS

B-153

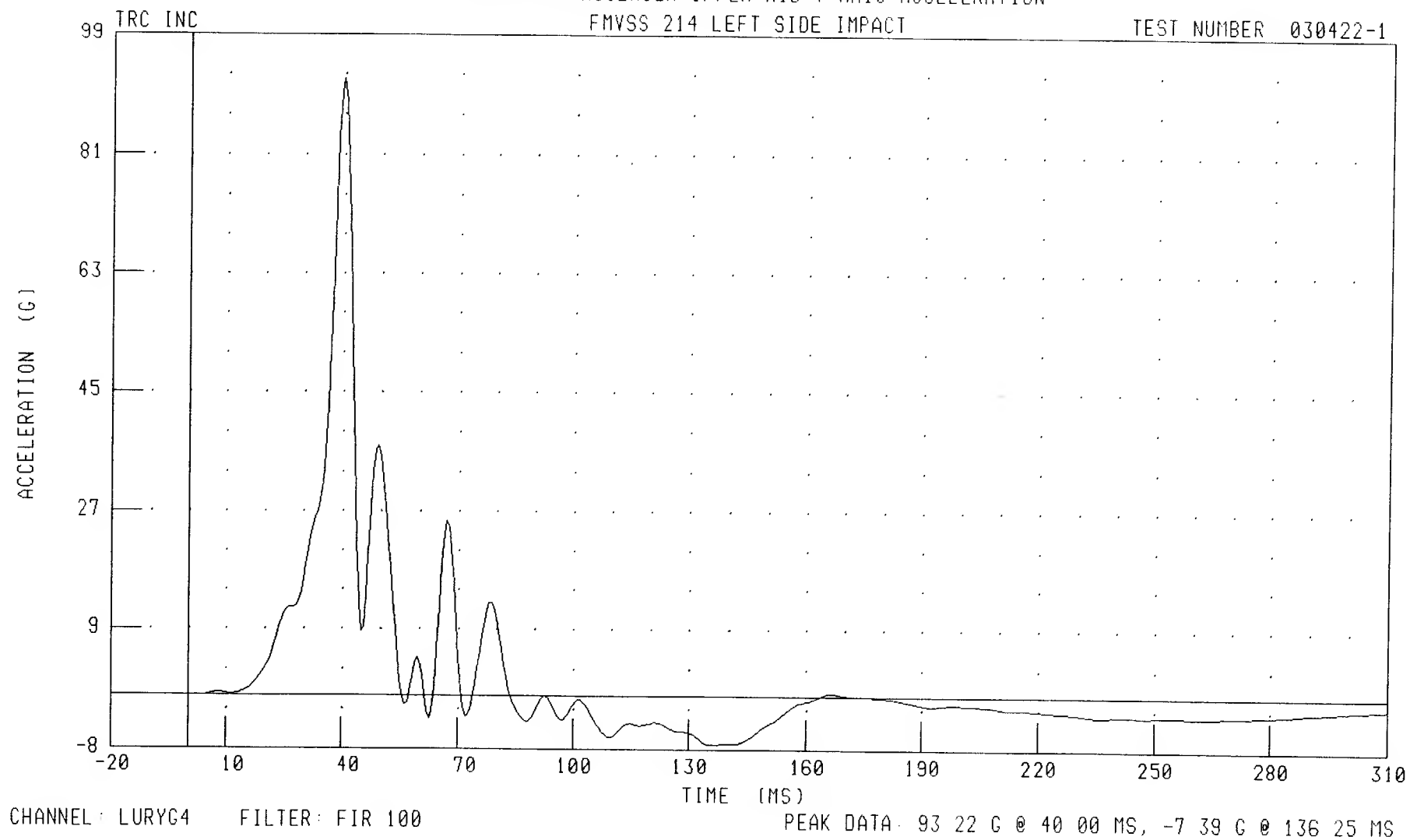
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

LEFT REAR PASSENGER UPPER RIB Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



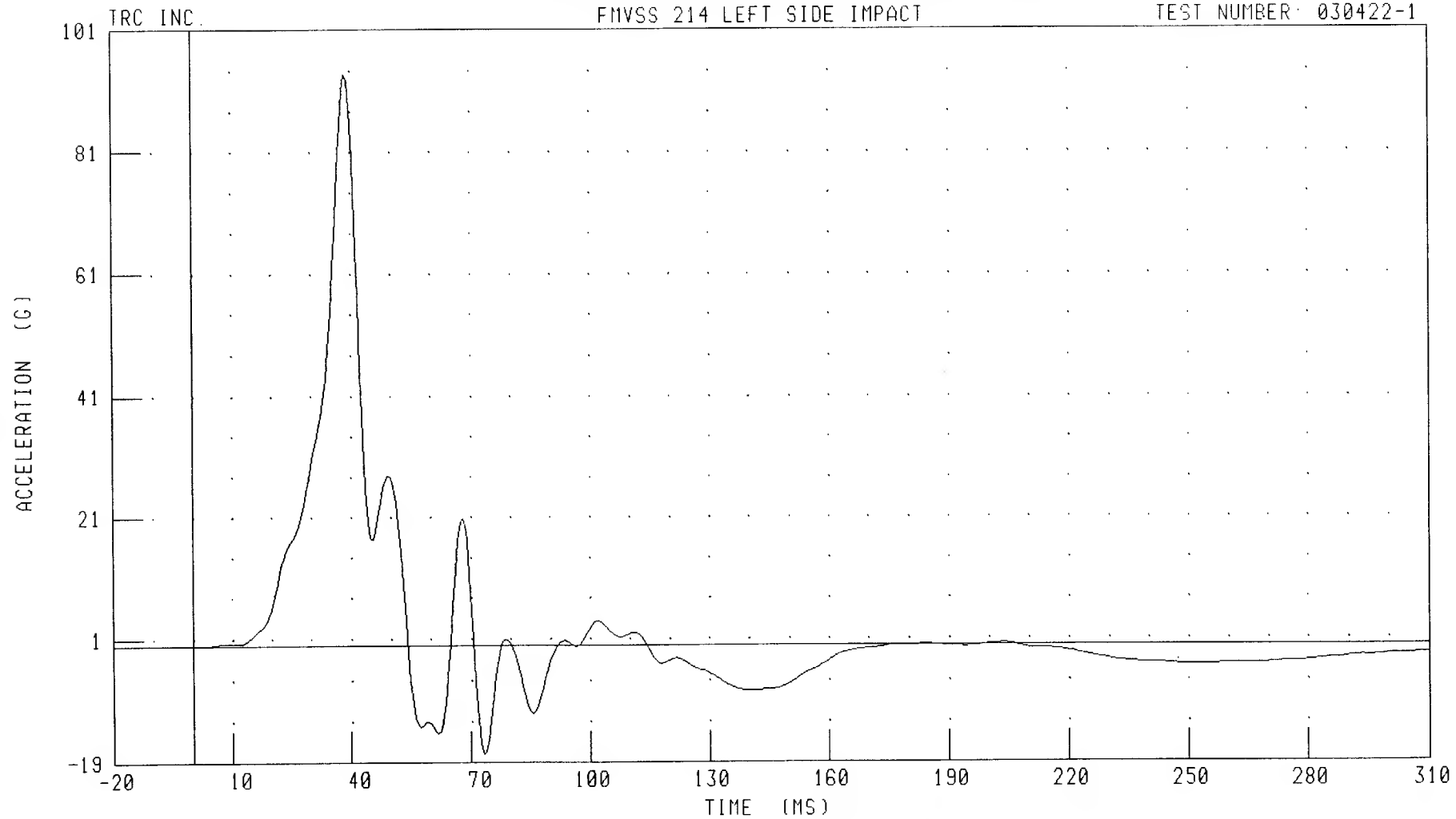
B-154

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT REAR PASSENGER LOWER RIB Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: LLRYG4

FILTER: FIR 100

PEAK DATA: 93.76 G @ 38.75 MS; -17.73 G @ 73.13 MS

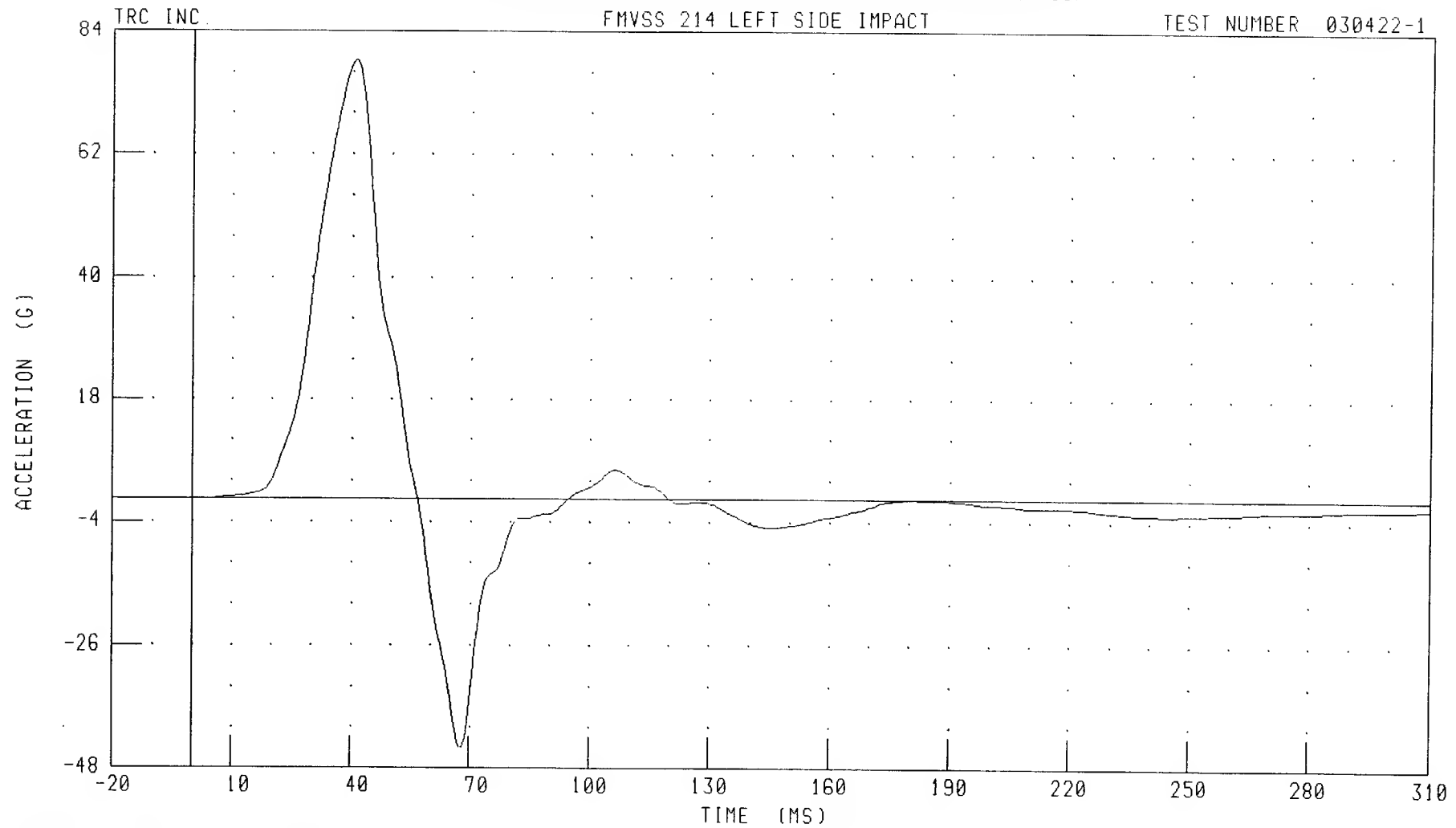
B-155

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT REAR PASSENGER LOWER SPINE Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



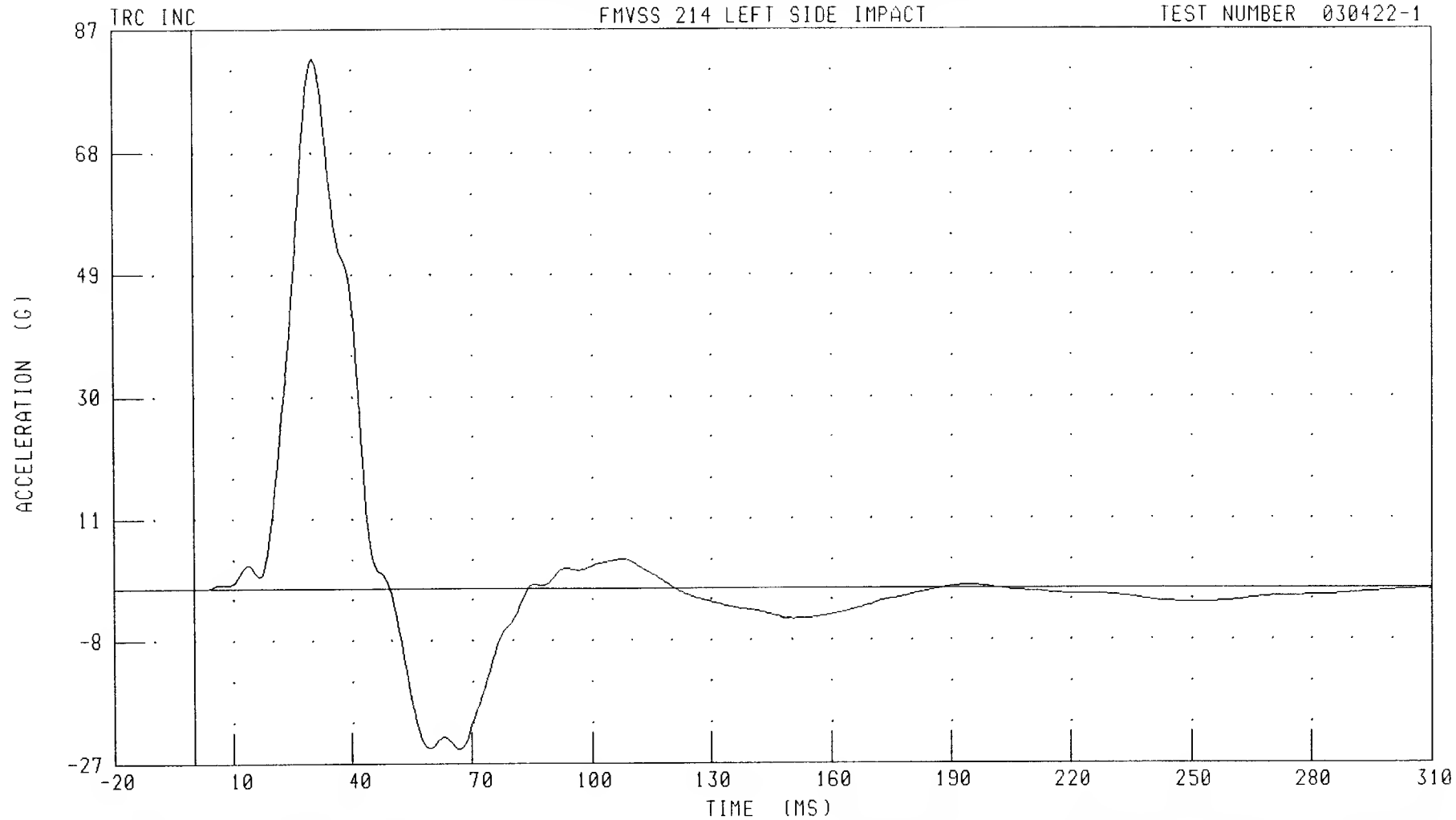
B-156

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT REAR PASSENGER PELVIS Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL: PEVYG4

FILTER: FIR 100

PEAK DATA 82.48 G @ 30.62 MS; -24.82 G @ 66.87 MS

B-157

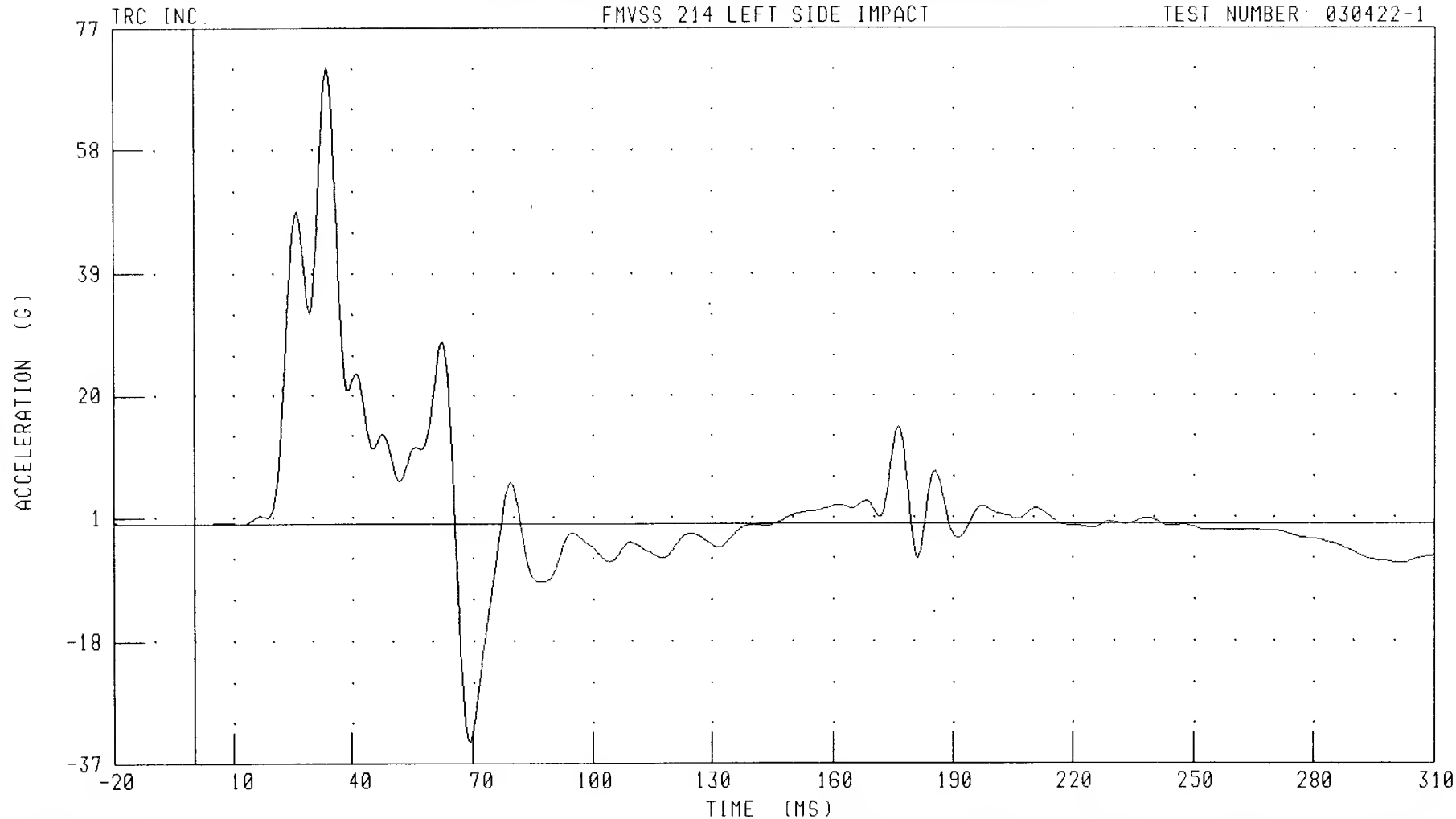
030422-1

Driver and Passenger Dummy Instrumentation Plots
Acceleration Data - FIR Filtered - Redundant

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
DRIVER UPPER RIB Y-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: LURYR1 FILTER: FIR 100

PEAK DATA: 70.90 G @ 33.75 MS; -33.78 G @ 69.38 MS

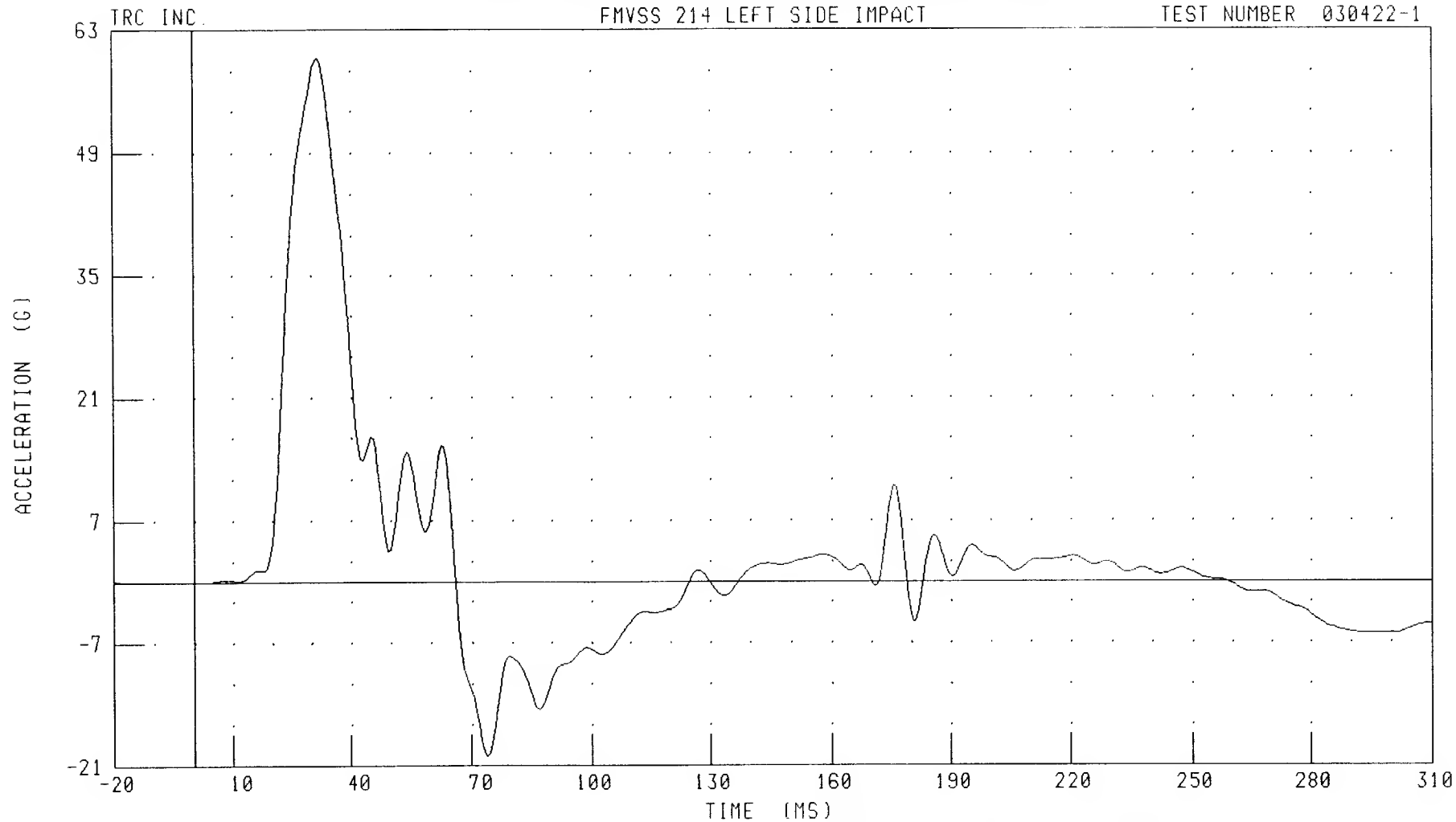
B-159

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
DRIVER LOWER RIB Y-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL: LLRYR1 FILTER: FIR 100

PEAK DATA: 59.83 G @ 31.88 MS; -19.95 G @ 73.75 MS

B-160

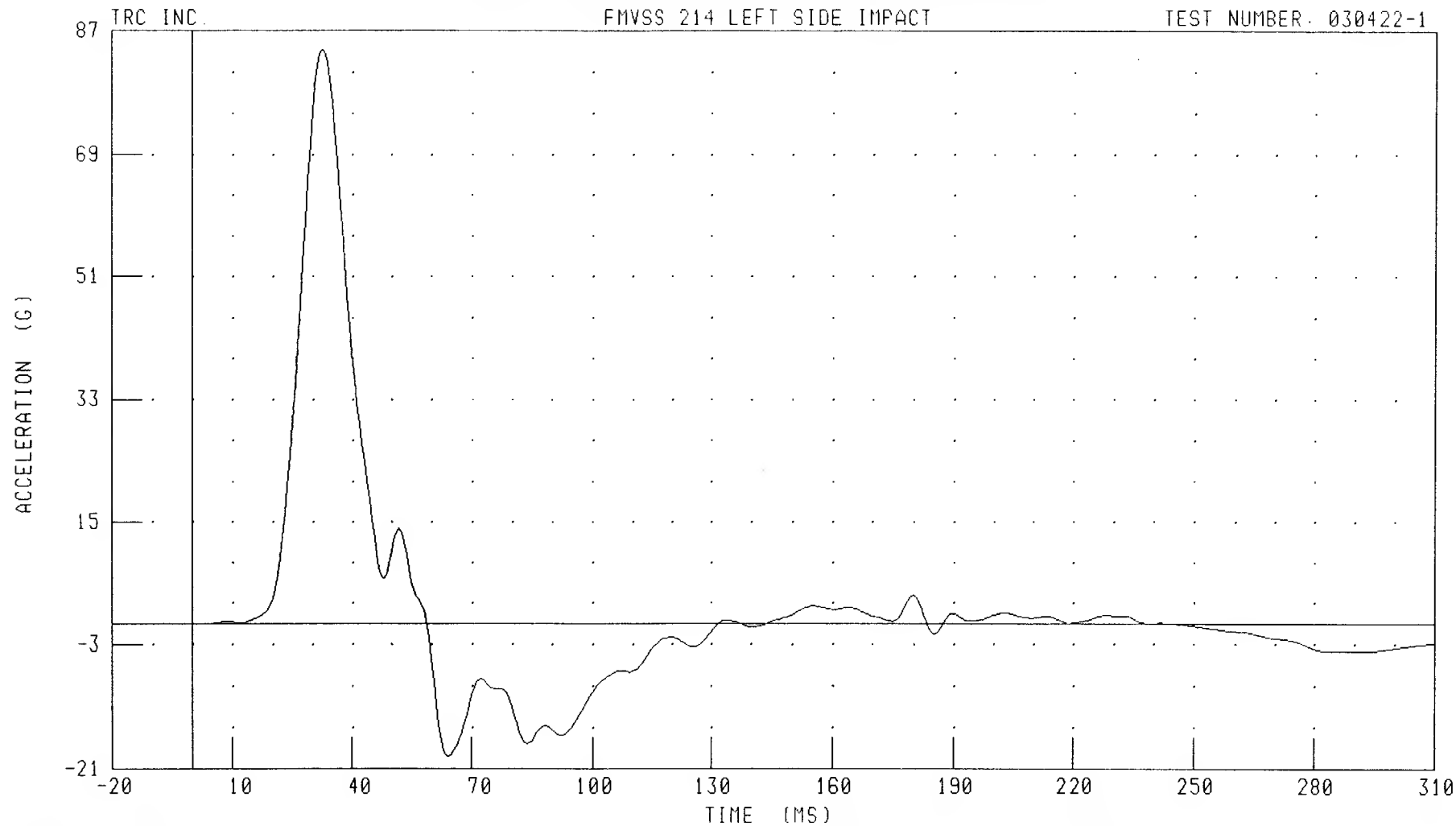
030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX

DRIVER LOWER SPINE Y-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: T12YR1 FILTER FIR 100

PEAK DATA: 84.37 G @ 32.50 MS; -19.21 G @ 64.38 MS

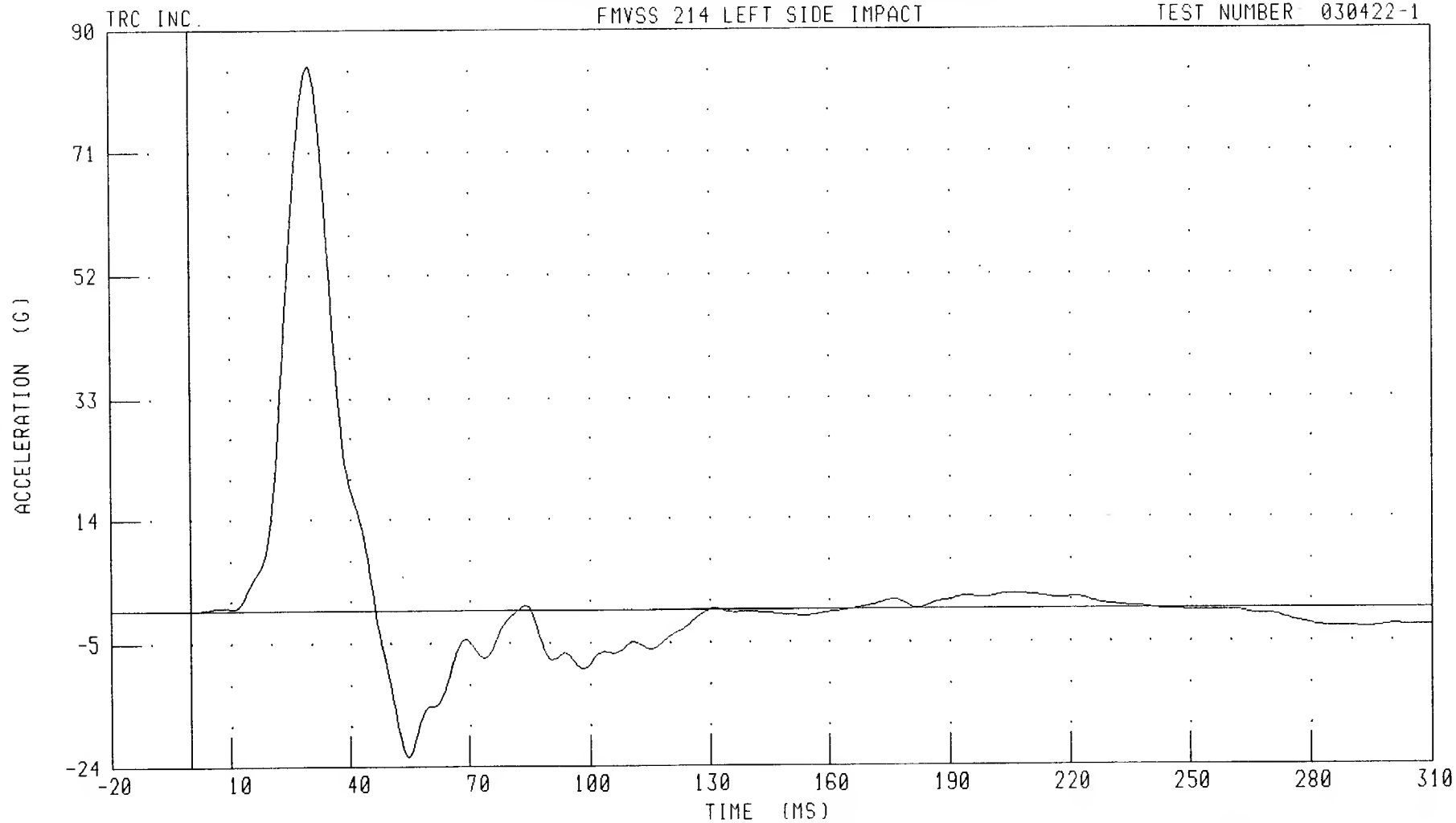
B-161

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
DRIVER PELVIS Y-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



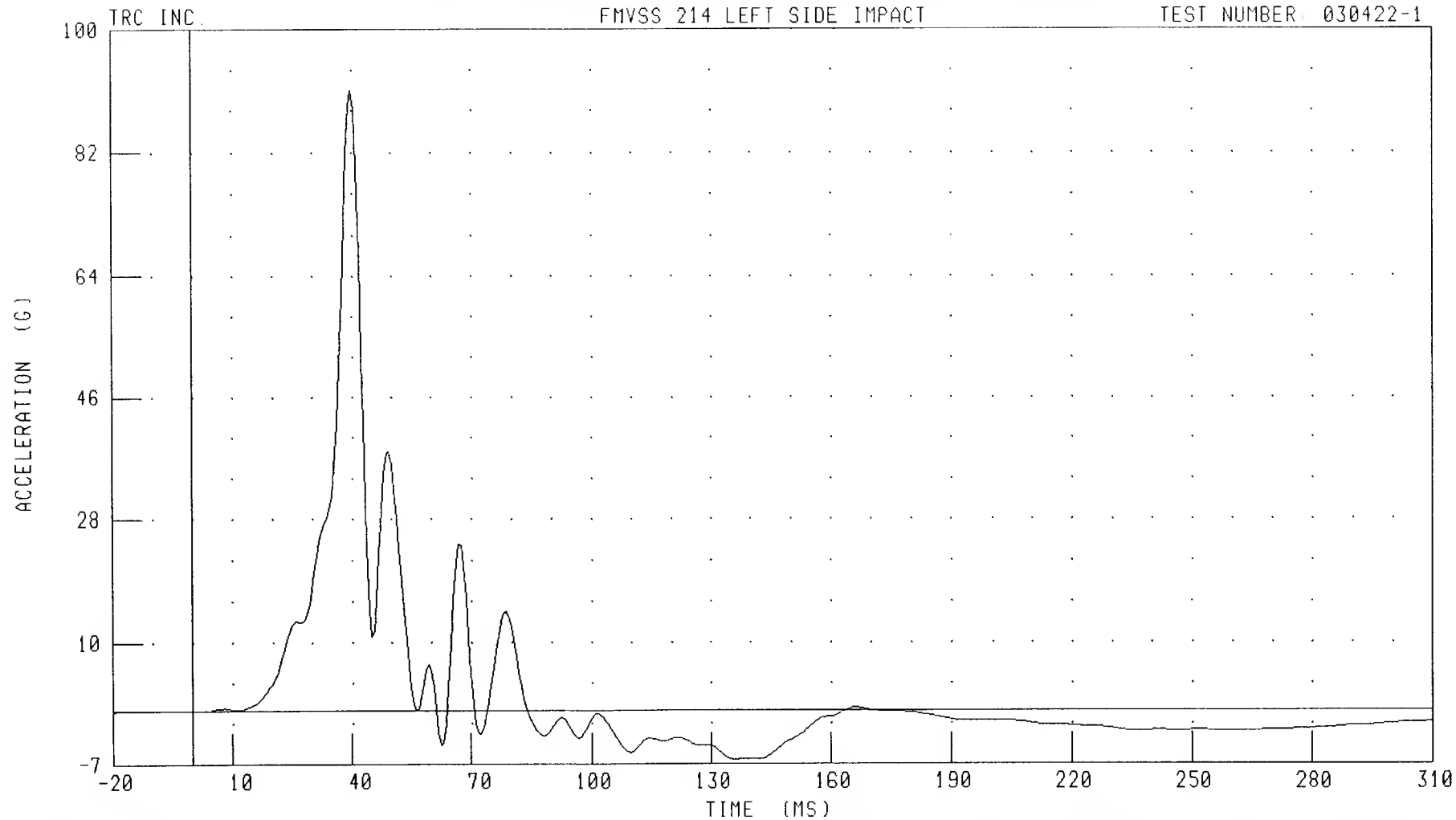
B-162

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT REAR PASSENGER UPPER RIB Y-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: LURYR4

FILTER: FIR 100

PEAK DATA: 91.22 G @ 40.00 MS; -7.27 G @ 136.25 MS

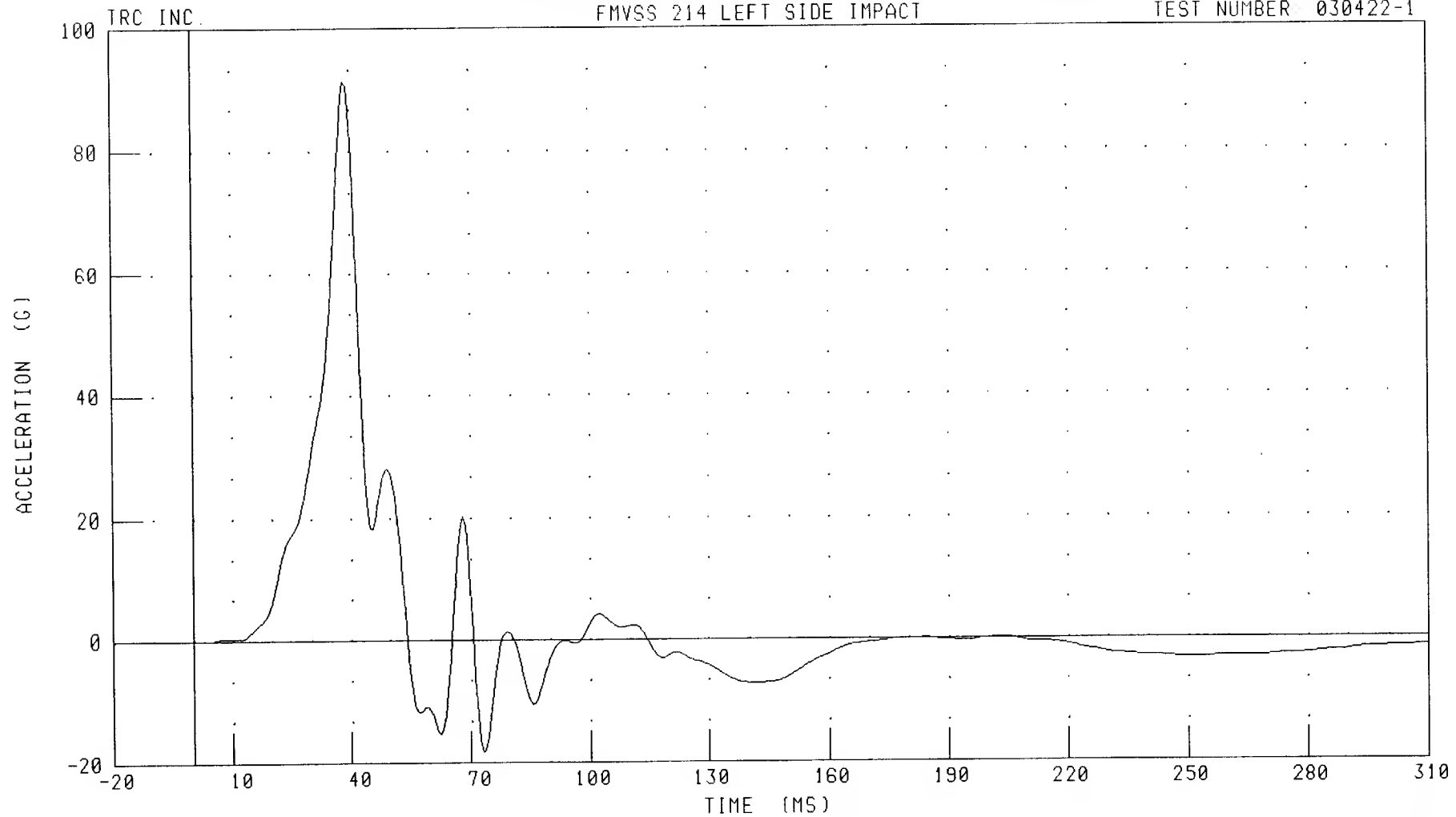
B-163

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT REAR PASSENGER LOWER RIB Y-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030422-1



CHANNEL: LLRYR4 FILTER: FIR 100

PEAK DATA: 91.47 G @ 38.75 MS; -18.27 G @ 73.13 MS

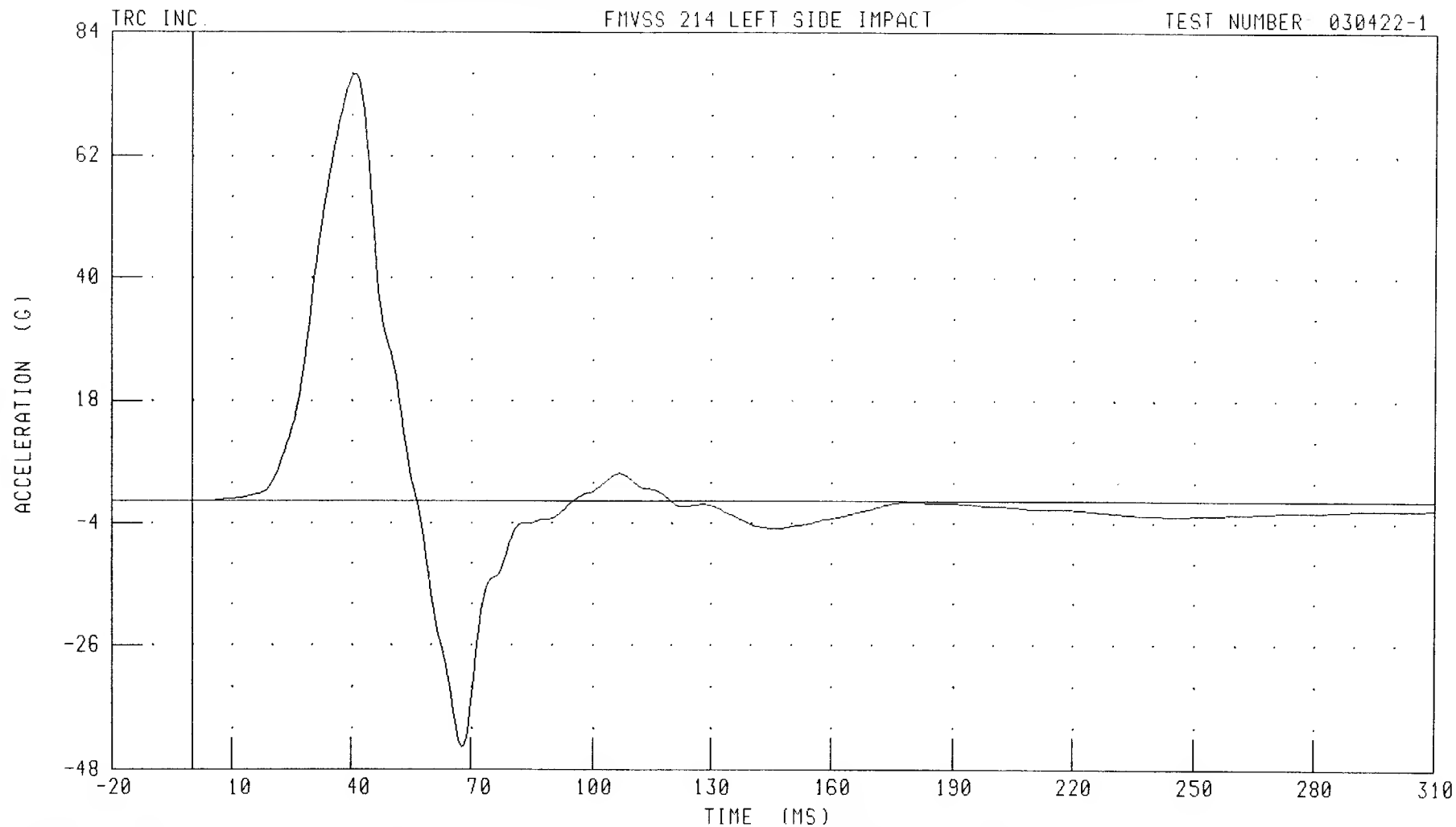
B-164

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT REAR PASSENGER LOWER SPINE Y-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: T12YR4 FILTER: FIR 100

PEAK DATA: 76.67 G @ 40.63 MS, -44.03 G @ 67.50 MS

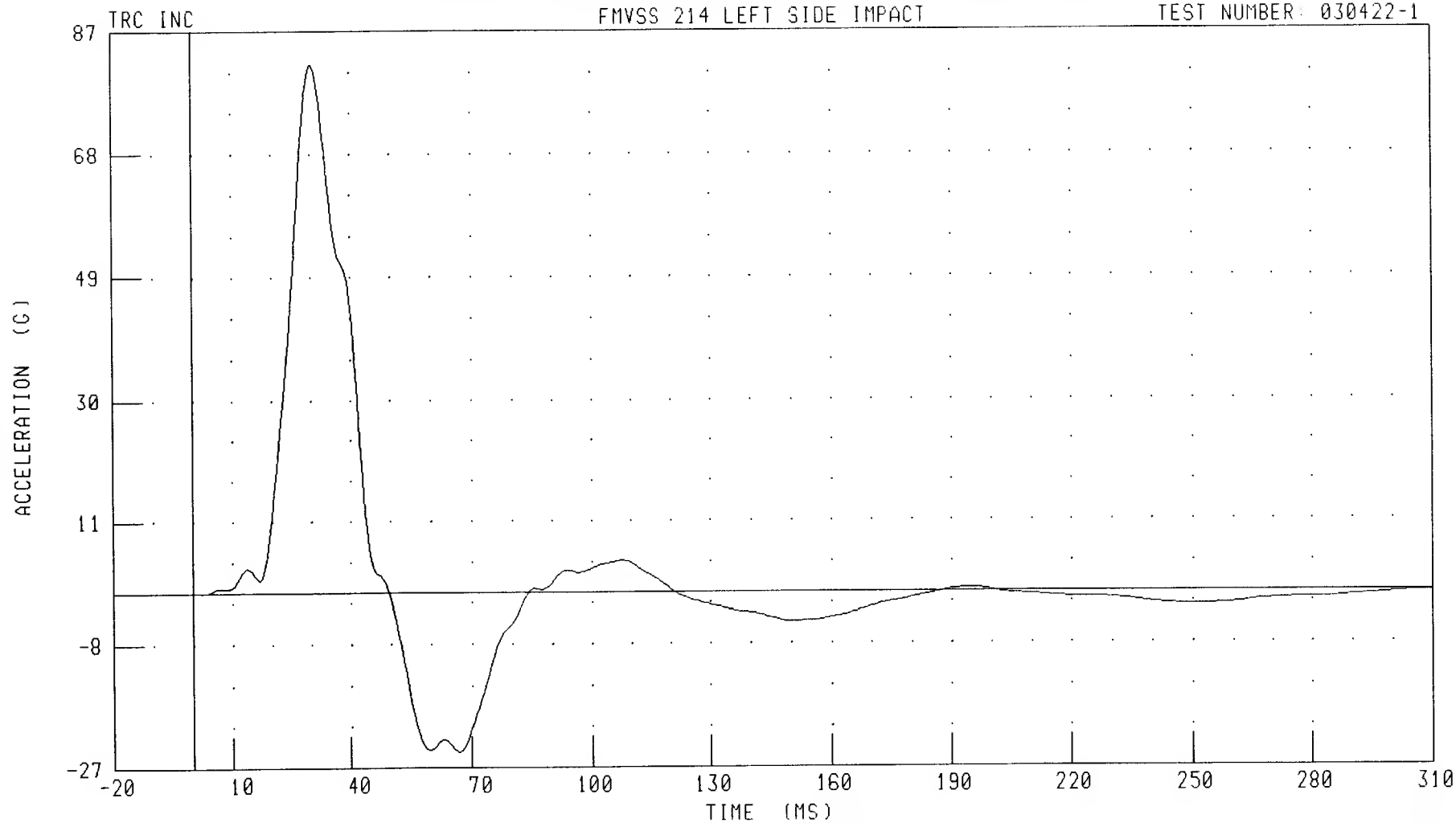
B-165

030422-1

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 PONTIAC GRAND PRIX
LEFT REAR PASSENGER PELVIS Y-AXIS REDUNDANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030422-1



CHANNEL: PEVYR4

FILTER: FIR 100

PEAK DATA: 81.97 G @ 30.62 MS, -24.62 G @ 66.87 MS

B-166

030422-1

Appendix C

SID-H3 Configuration and Performance Verification Data

Summary
SID-H3 Pre-Test and Post-Test Calibration
Configured For Left Side Impact

Date: April 16-29, 2003 TRC Inc. Test Number: 065C08/C09 & 066C07/C08

Laboratory Technician: Jack Willeke & Chris Roberts

Test Parameter	Specification	SID-H3 065		SID-H3 066	
		Pre-Test	Post-Test	Pre-Test	Post-Test
SH - Seated Height (mm)	889-909	894	896	903	902
RH - Rib Height (mm)	502-520	511	510	508	507
HP - Hip Pivot Height (mm)	99 ref	99.1	99.1	99.1	99.1
RD - Rib from Back Line (mm)	229-241	238	239	237	238
KH - Knee Pivot from Back Line (mm)	511-526	514	513	519	521
KV - Knee Pivot to Floor (mm)	490-505	499	500	498	497
HW - Hip Width (mm)	356-391	370	371	388	387
Thorax Impacts					
Temperature (°C)	18.9-25.5	22.2	21.1	21.7	21.7
Relative Humidity (%)	10-70	41.0	26.0	38.0	26.0
Probe Speed (m/s)	4.27-4.33	4.30	4.25	4.26	4.23
Upper Rib (g's)	37-46	43.2	40.2	39.9	41.0
Lower Rib (g's)	37-46	39.7	39.1	40.6	40.2
Lower Spine (g's)	15-22	19.6	20.1	18.7	19.2
Pelvis Impacts					
Temperature (°C)	18.9-25.5	22.2	21.1	21.7	21.7
Relative Humidity (%)	10-70	41.0	25.0	38.0	26.0
Probe Speed (m/s)	4.27-4.33	4.25	4.26	4.26	4.28
Pelvis (g's)	40-60	53.5	50.9	42.6	53.7

Calibration Test Results

Pre-Test

SID-H3: 065

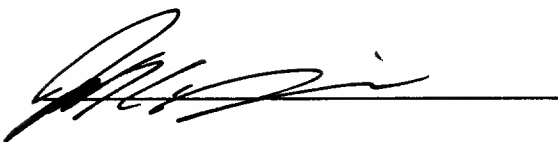
Configured for Left Side Impact

External Dimensions:	The dummy passed all external dimension requirements.
Lateral Head Drop Test:	The head passed all lateral drop test requirements.
Lateral Neck Test:	The neck passed all impact test requirements.
Lateral Thorax Impact Test:	The thorax passed all impact test requirements.
Thoracic Shock Absorber Test:	The thoracic shock absorber passed all test requirements.
Lumbar Flexion Test:	The dummy met the lumbar flexion test requirements.
Abdominal Compression Test:	The abdomen met the compression test requirements.
Pelvis Impact Test:	The lateral pelvis passed all impact test requirements.

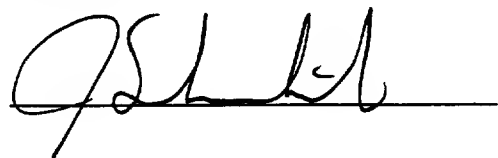
Transportation Research Center Inc.
572F SID Dummy
External Dimensions
Serial No. 065 Calibration No. 08

Test Parameter	Dimension	Specification	Results	Pass
Seated Height	SH	889.0 - 909.3 mm	894 mm	Yes
Rib Height	RH	501.7 - 520.7 mm	511 mm	Yes
Hip Pivot Height	HP	99.1 REF mm	99.1 mm	
Rib From Backline	RD	228.6 - 241.3 mm	238 mm	Yes
Knee Pivot From Backline	KH	510.5 - 525.8 mm	514 mm	Yes
Knee Pivot From Floor	KV	490.2 - 505.5 mm	499 mm	Yes
Hip Width	HW	355.6 - 391.2 mm	370 mm	Yes
Top Rib Width From C/L	RW-1	165.1 - 180.3 mm	169 mm	Yes
Bottom Rib Width From C/L	RW-2	165.1 - 180.3 mm	168 mm	Yes
Difference Between Top & Bottom Rib Width from C/L		<= 2.5 mm	1.0 mm	Yes

Technician



Approved




TRANSPORTATION RESEARCH CENTER INC.

LATERAL HEAD DROP TEST

SID/HIII DUMMY

17-APR-03

LEFT SIDE CONFIGURATION

TRC INC.

TEST NO. HDL06508

572M SID/HIII SN065 HEAD CAL08

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.6 deg. C	21.67 deg. C
RELATIVE HUMIDITY	10 - 70 %	29.00 %
PEAK RESULTANT ACCELERATION	120 - 150 G	127.54 G
PEAK LONGITUDINAL ACCELERATION	15 G MAX	-5.18 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN



RUN NUMBER: 042803.0629;1

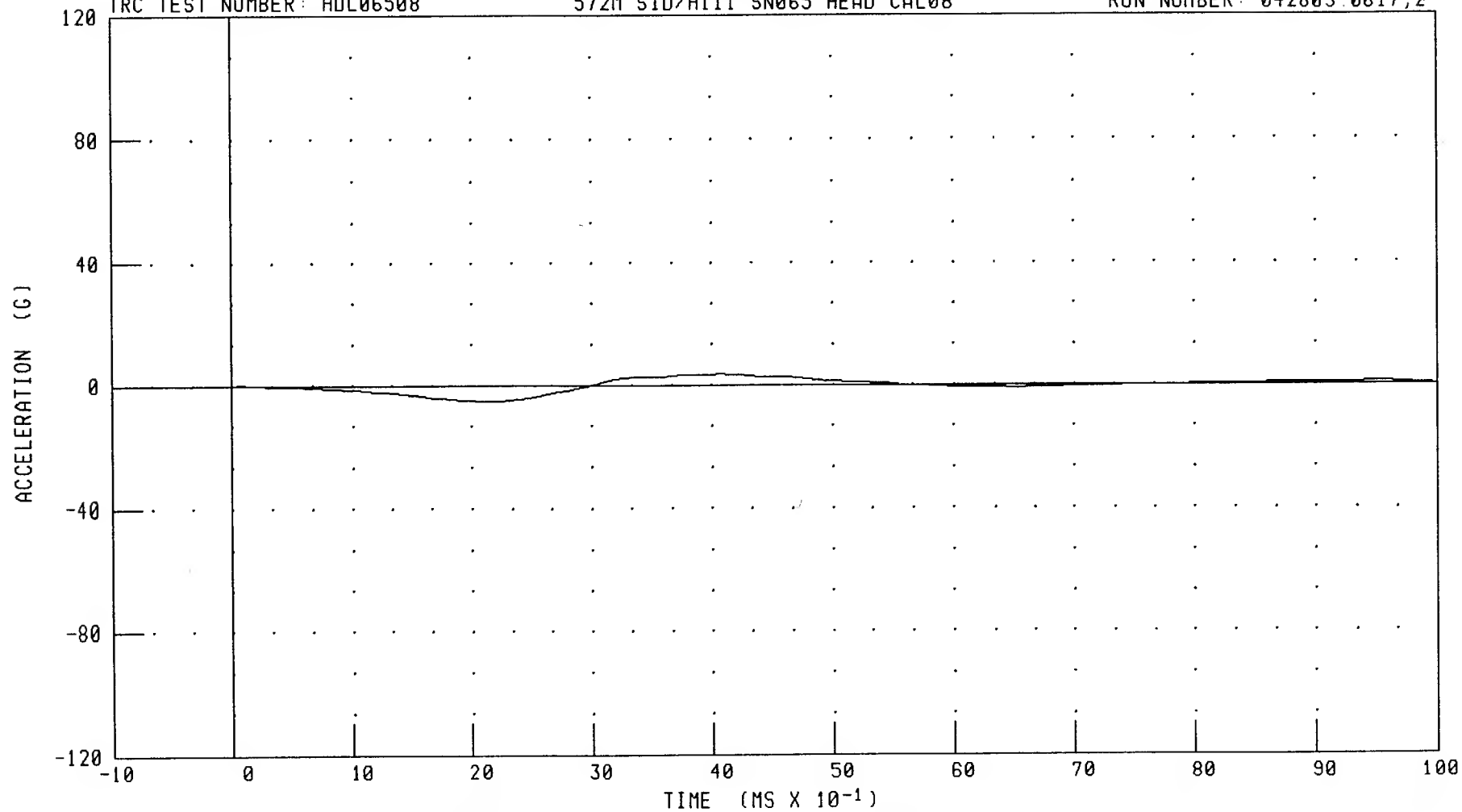
572M SID/HIII DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD ACCELERATION X AXIS

TRC TEST NUMBER: HDL06508

572M SID/HIII SN065 HEAD CAL08

RUN NUMBER: 042803.0617;2



CHANNEL: HEDXC

FILTER: CH. CLASS 1000

PEAK DATA: 3.42 G @ 4.08 MS; -5.18 G @ 2.08 MS

030422-1

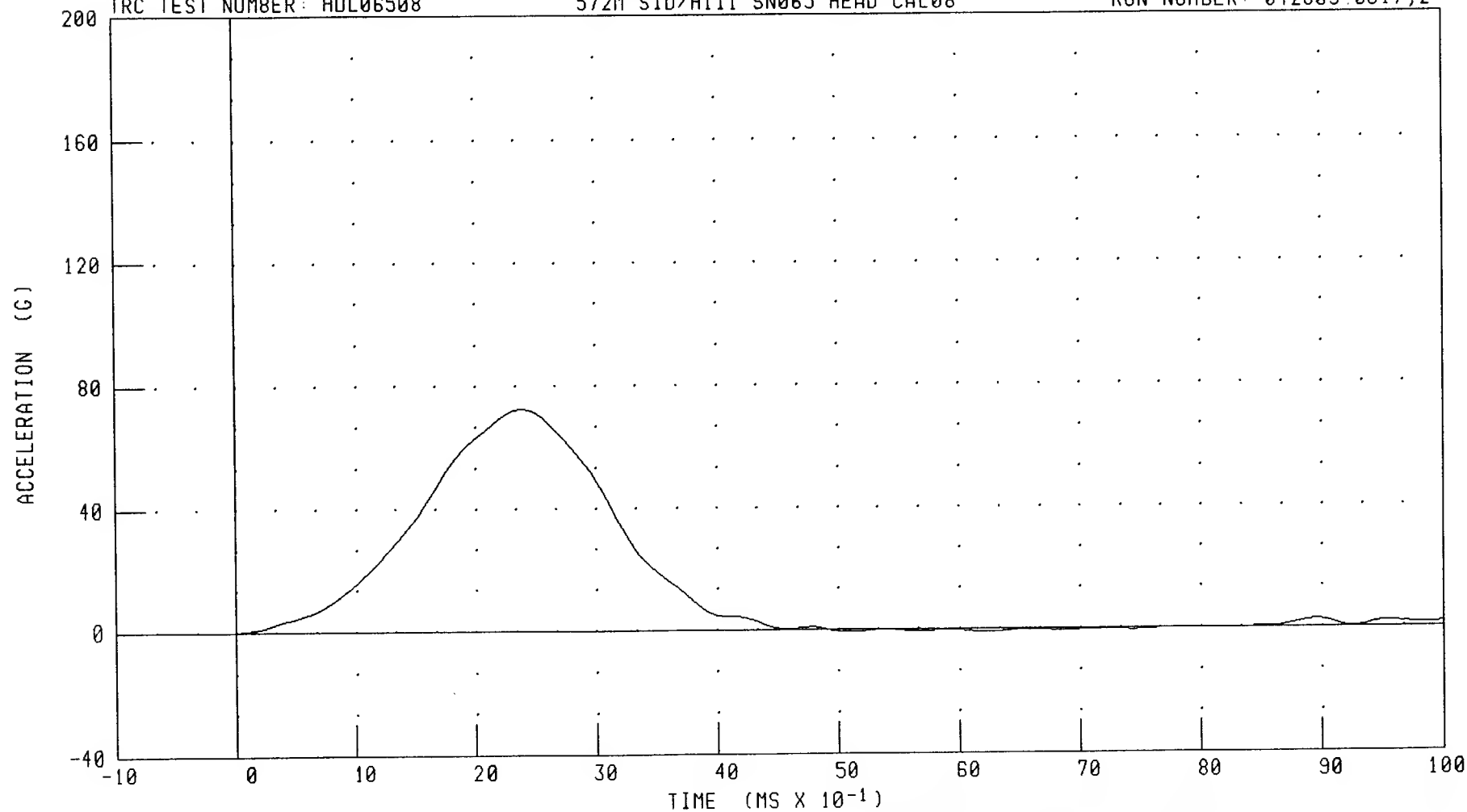
572M SID/HIII DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD ACCELERATION Y AXIS

TRC TEST NUMBER: HDL06508

572M SID/HIII SN065 HEAD CAL08

RUN NUMBER: 042803.0617;2



CHANNEL: HEDYG

FILTER: CH. CLASS 1000

PEAK DATA: 72.46 G @ 2.40 MS; -1.15 G @ 6.24 MS

030422-1

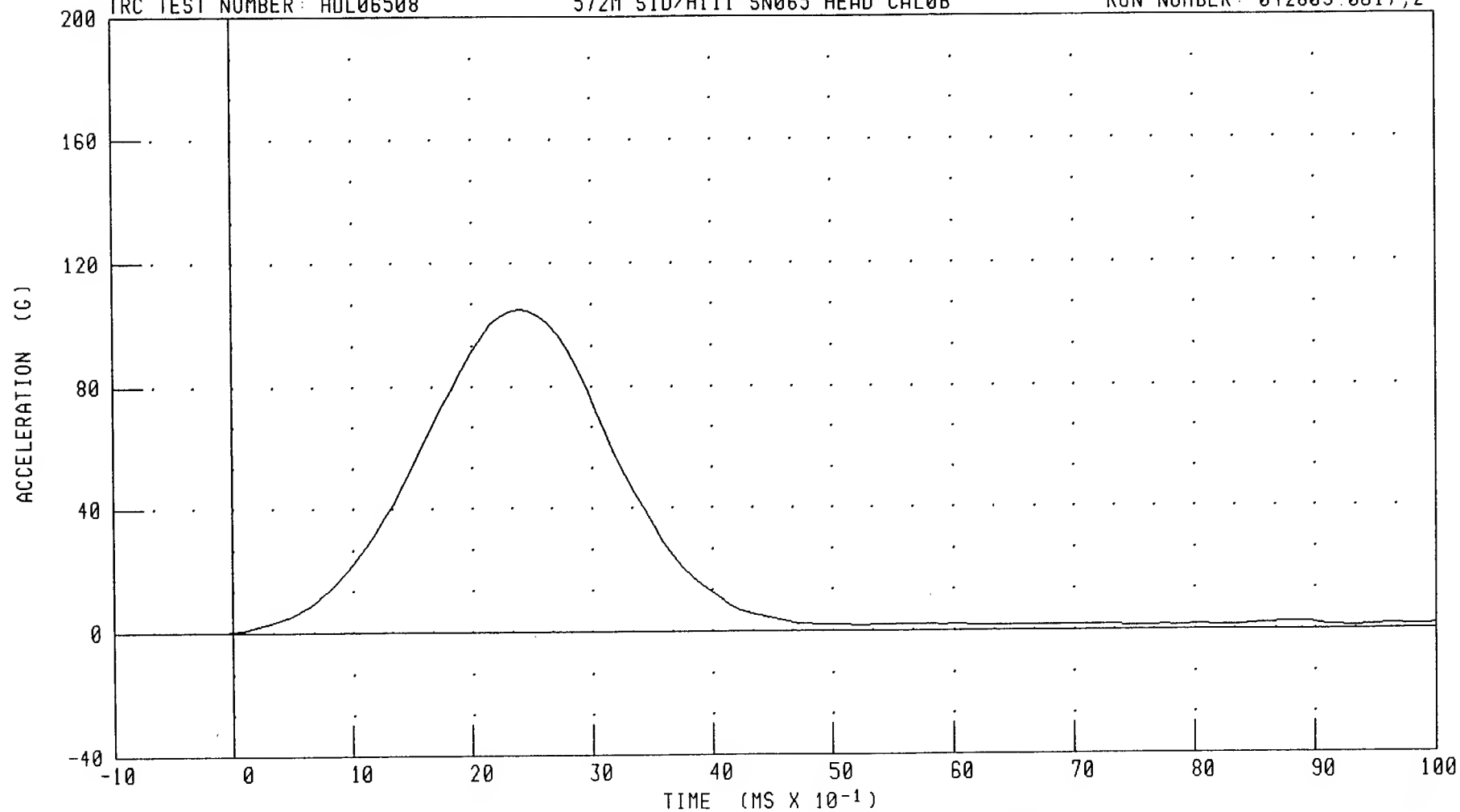
572M SID/HIII DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD ACCELERATION Z AXIS

TRC TEST NUMBER: HDL06508

572M SID/HIII SN065 HEAD CAL0B

RUN NUMBER: 042803.0617;2



CHANNEL: HEDZG

FILTER: CH. CLASS 1000

PEAK DATA: 104.86 G @ 2.40 MS; -0.05 G @ -0.16 MS

030422-1

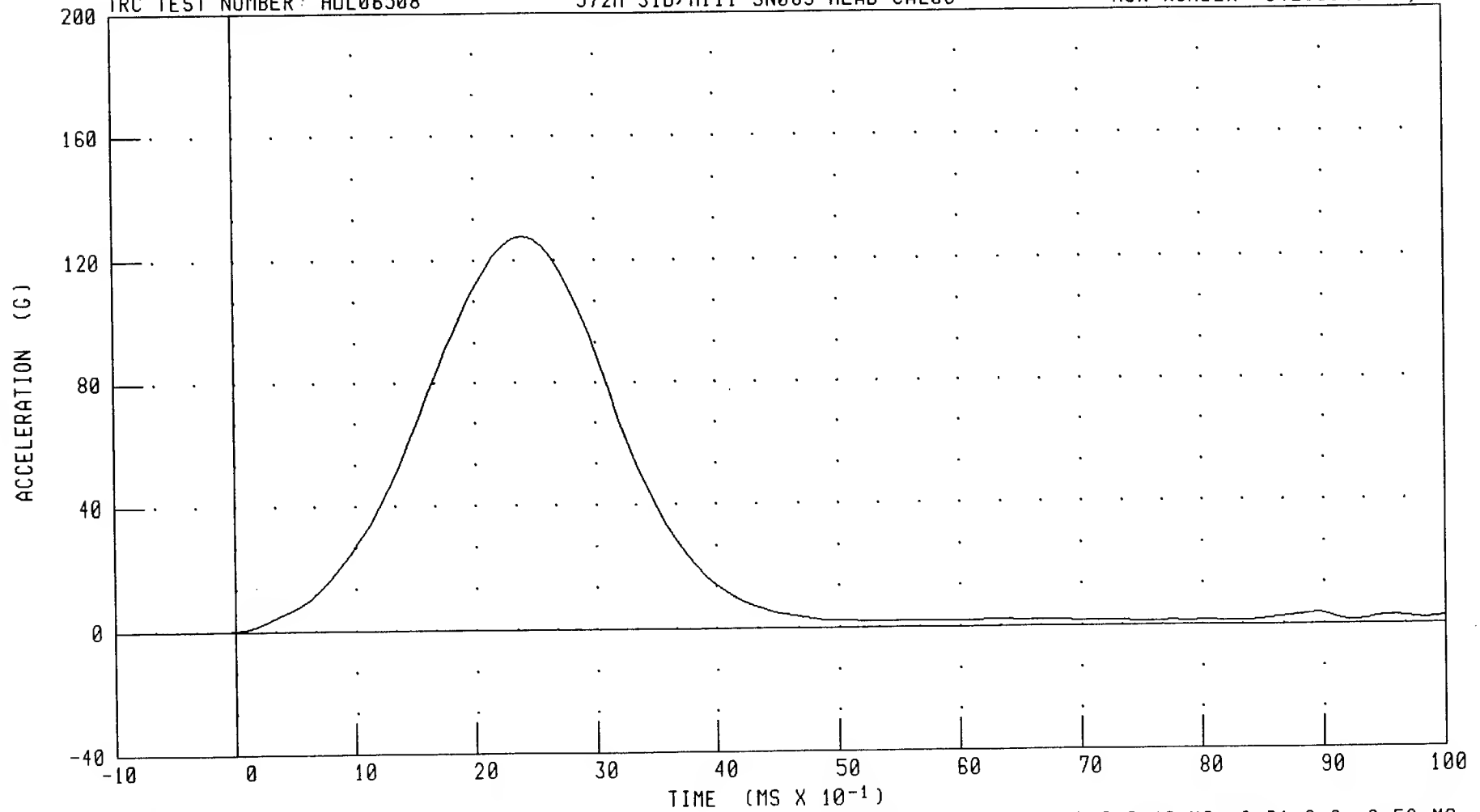
572M SID/HIII DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD RESULTANT ACCELERATION

TRC TEST NUMBER: HDL06508

572M SID/HIII SN065 HEAD CAL08

RUN NUMBER: 042803.0617;2



CHANNEL: HEDRG

FILTER: CH. CLASS 1000

PEAK DATA: 127.54 G @ 2.40 MS; 0.01 G @ -0.56 MS

030422-1

TRANSPORTATION RESEARCH CENTER INC.

LATERAL NECK TEST

HYBRIDIII SID DUMMY

17-APR-03

LEFT SIDE CONFIGURATION

TRC INC.

TEST NO. NFL06508

H3/SID SN065 NECK LEFT CAL08

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 deg. C	21.11 deg. C
RELATIVE HUMIDITY		10 - 70 %	40.00 %
IMPACT VELOCITY		6.89 - 7.13 M/S	7.06 M/S
INTEGRATED VELOCITY	10 MS	1.96 - 2.55 M/S	2.53 M/S
	20 MS	4.12 - 5.10 M/S	4.95 M/S
	30 MS	5.73 - 7.01 M/S	6.91 M/S
	40 - 70 MS	6.27 - 7.64 M/S	7.14- 7.23 M/S
MAXIMUM MIDSAGGITAL PLANE ROTATION		66 - 82 deg.	70.33 deg.
ROTATION ANGLE DECAY TIME FROM PEAK TO ZERO		58 - 67 MS	59.84 MS
MAXIMUM MOMENT ABOUT OCCIPITAL CONDYLE		73 - 88 NM	82.84 NM
POSITIVE MOMENT DECAY TIME FROM PEAK TO ZERO		49 - 64 MS	52.48 MS
TIME OF MAXIMUM ROTATION AFTER MAXIMUM MOMENT		2 - 16 MS	8.64 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN 

RUN NUMBER: 041703.1452;1

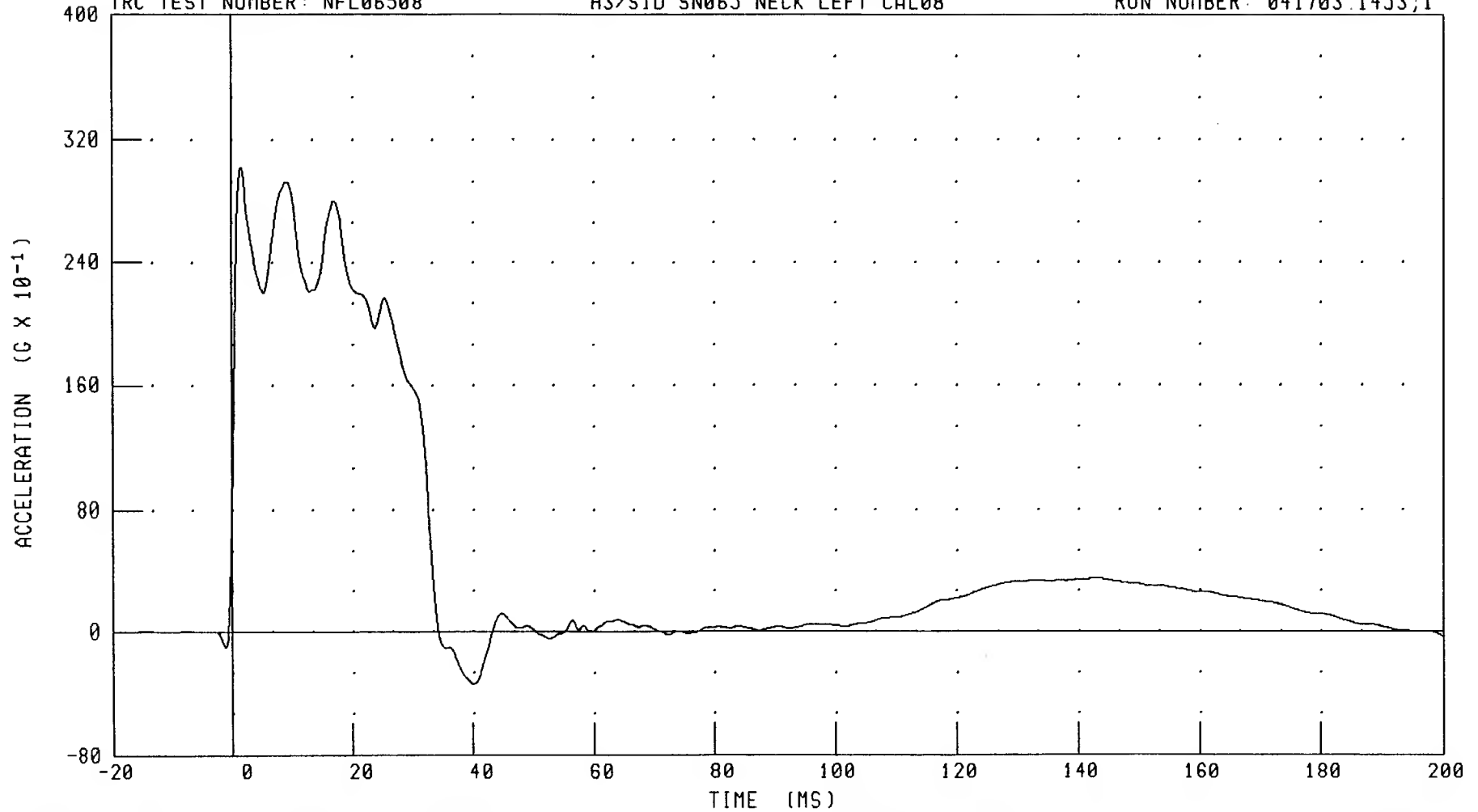
H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

PENDULUM DECELERATION

TRC TEST NUMBER: NFL06508

H3/SID SN065 NECK LEFT CAL08

RUN NUMBER: 041703.1453;1



CHANNEL: PENXC

FILTER: CH. CLASS 180

PEAK DATA: 30.27 G @ 1.60 MS; -3.40 G @ 40.00 MS

030422-1

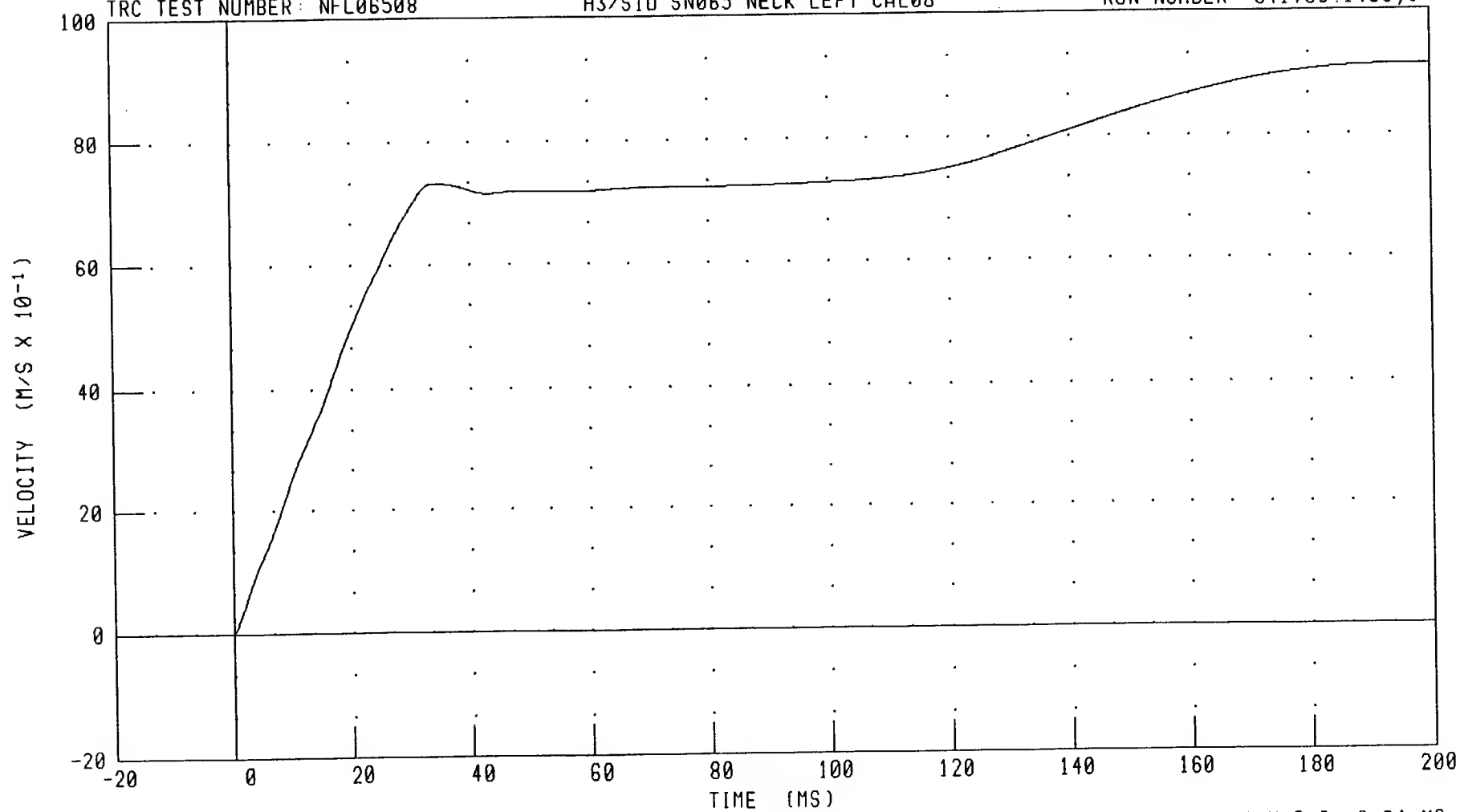
H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

INTEGRATED PENDULUM VELOCITY

H3/SID SN065 NECK LEFT CAL08

RUN NUMBER: 041703.1453;1

TRC TEST NUMBER: NFL06508



CHANNEL: PENXVI

FILTER: CH. CLASS 180

PEAK DATA: 9.14 M/S @ 194.72 MS; -0.01 M/S @ -0.64 MS

C-12

030422-1

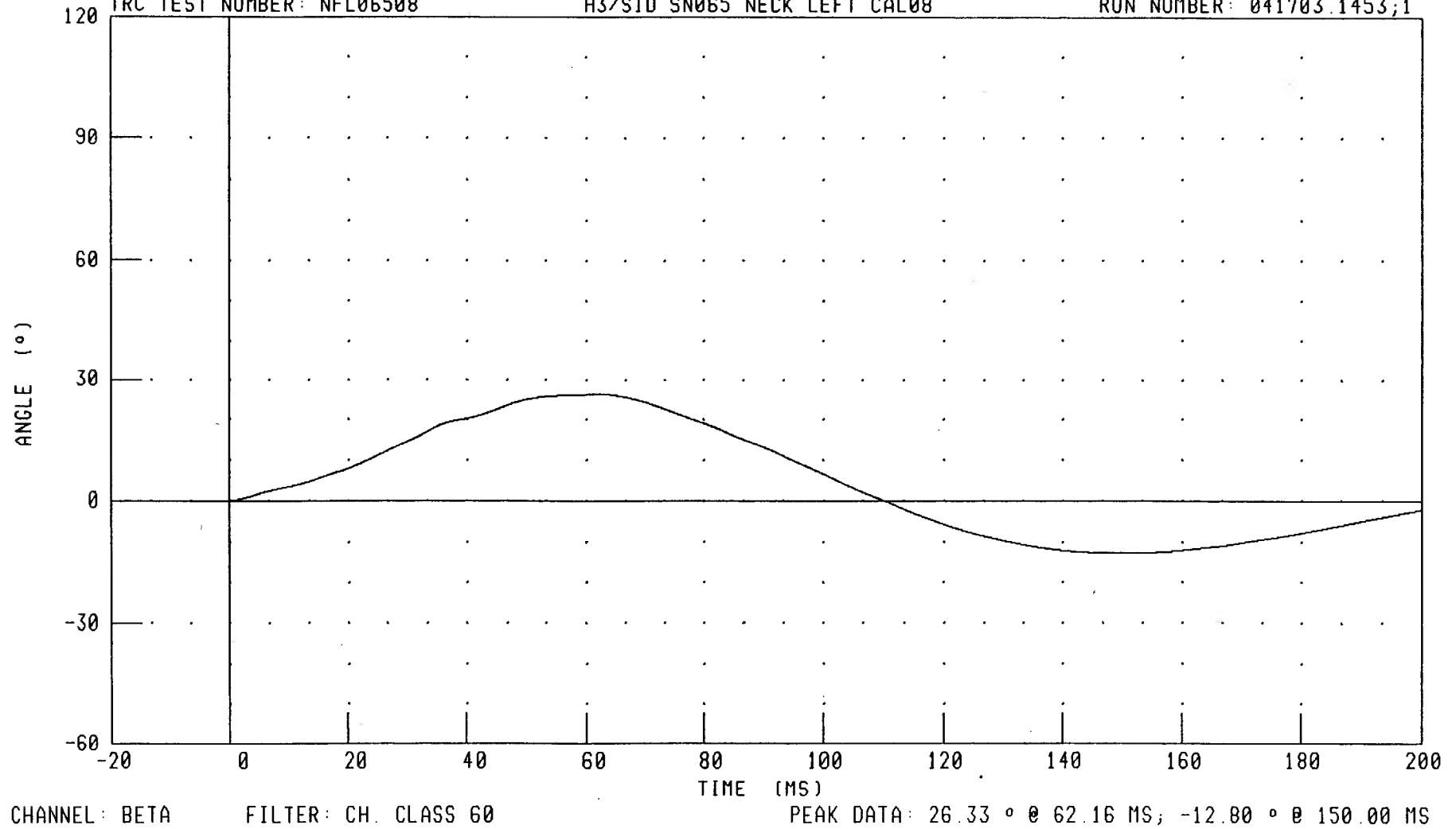
H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

ROTATION ABOUT BASE OF NECK

TRC TEST NUMBER: NFL06508

H3/SID SN065 NECK LEFT CAL08

RUN NUMBER: 041703.1453;1



C-13

030422-1

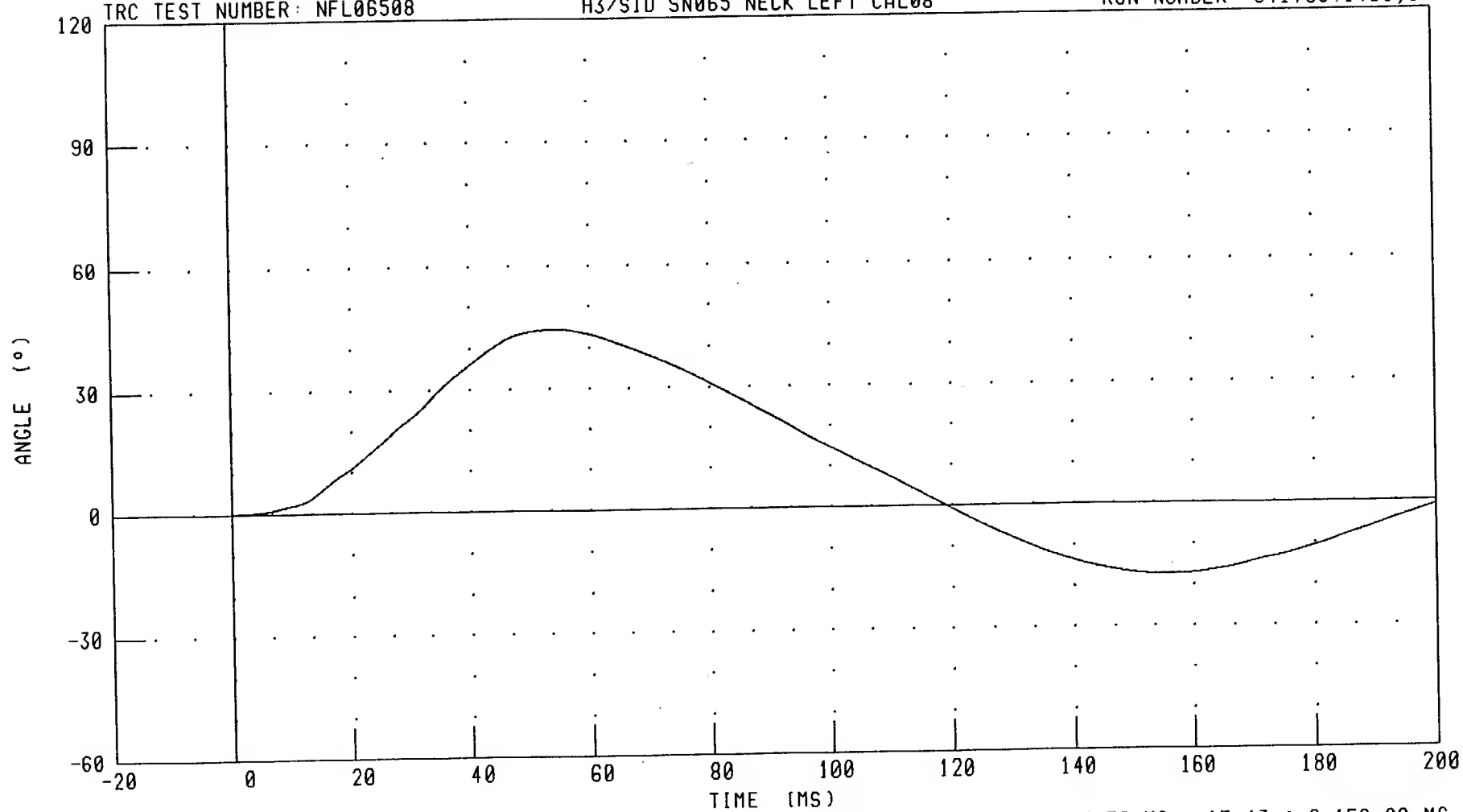
H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

ROTATION ABOUT OCCIPITAL CONDYLE

H3/SID SN065 NECK LEFT CAL08

RUN NUMBER: 041703.1453;1

TRC TEST NUMBER: NFL06508



CHANNEL: THETA

FILTER: CH. CLASS 60

PEAK DATA: 44.40 ° @ 54.56 MS; -17.43 ° @ 156.08 MS

C-14

030422-1

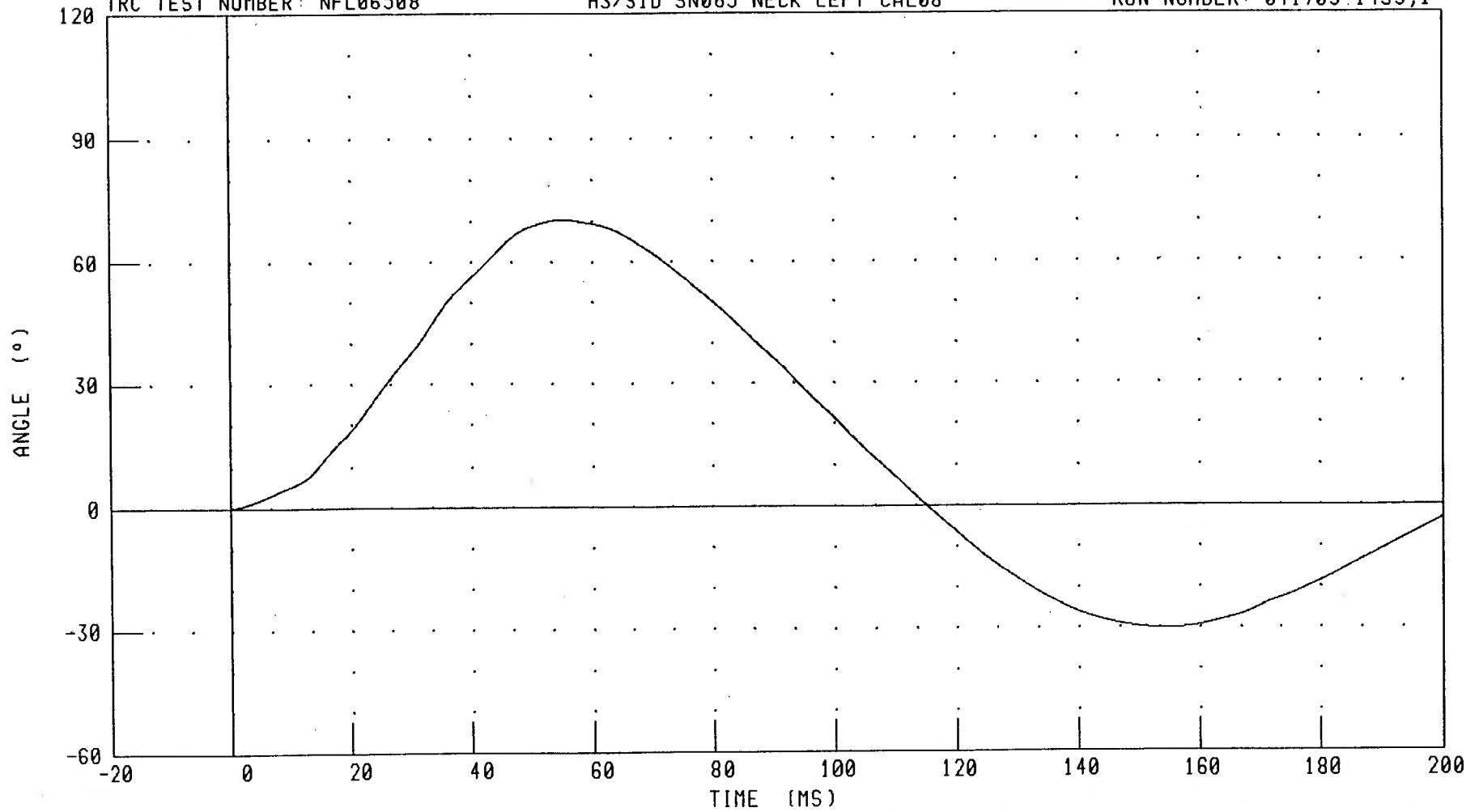
H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

TOTAL ROTATION

TRC TEST NUMBER: NFL06508

H3/SID SN065 NECK LEFT CAL08

RUN NUMBER: 041703.1453;1



CHANNEL: TOTAN

FILTER: CH. CLASS 60

PEAK DATA: 70.33 ° @ 55.28 MS; -30.12 ° @ 154.48 MS

030422-1

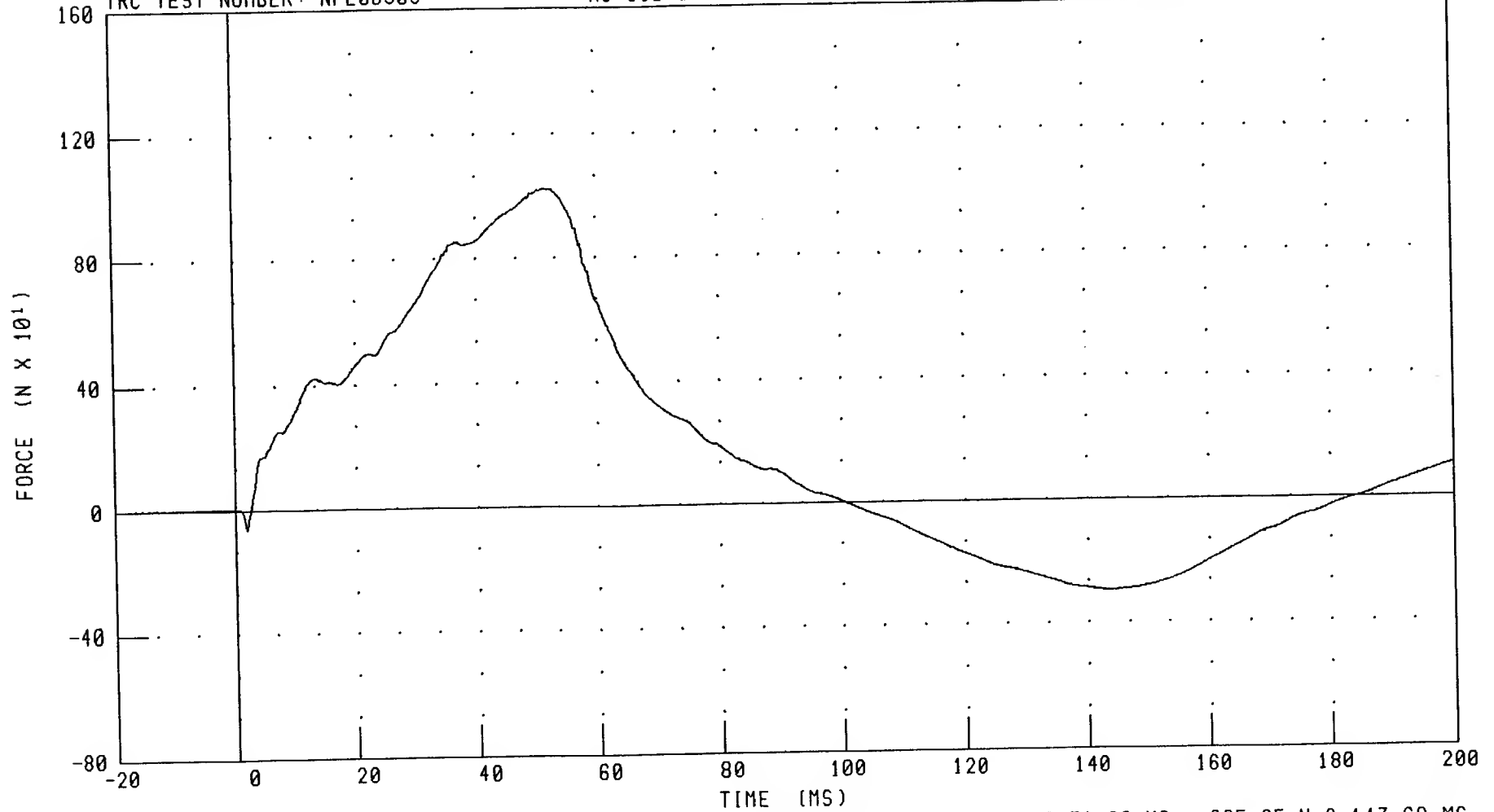
H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

NECK FORCE Y AXIS

TRC TEST NUMBER: NFL06508

H3/SID SN065 NECK LEFT CAL08

RUN NUMBER: 041703.1453;1



CHANNEL: NEKYF

FILTER: CH. CLASS 1000

PEAK DATA: 1025.04 N @ 51.60 MS; -295.95 N @ 143.68 MS

C-16

030422-1

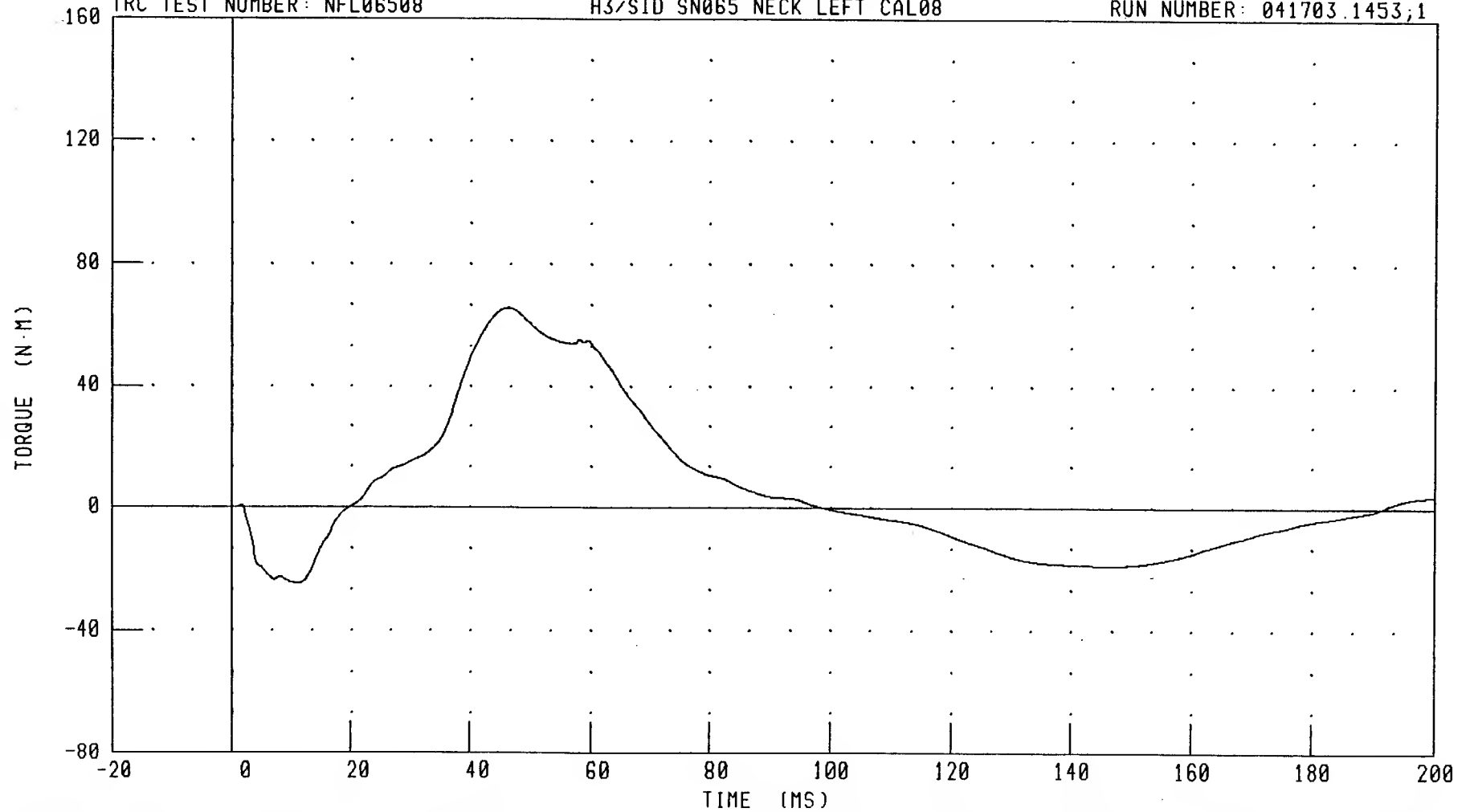
H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

NECK MOMENT X AXIS

TRC TEST NUMBER: NFL06508

H3/SID SN065 NECK LEFT CAL08

RUN NUMBER: 041703.1453;1



CHANNEL: NEKXM

FILTER: CH. CLASS 600

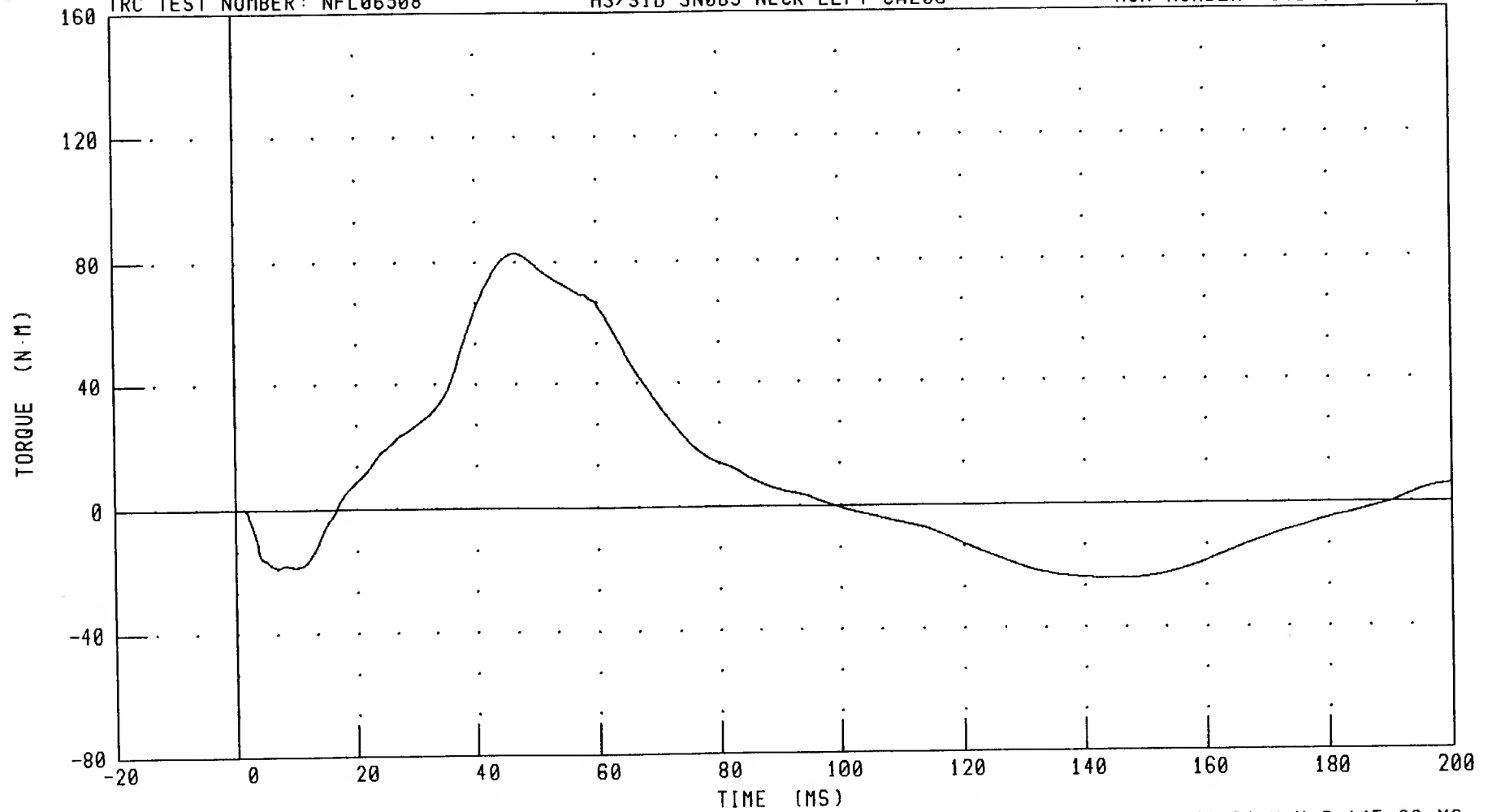
030422-1

H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST
TOTAL MOMENT ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: NFL06508

H3/SID SN065 NECK LEFT CAL08

RUN NUMBER: 041703.1453;1



CHANNEL: NEKDM

FILTER: CH. CLASS 600

PEAK DATA: 82.84 N·m @ 46.64 ms; -24.24 N·m @ 145.60 ms

030422-1

TRANSPORTATION RESEARCH CENTER INC.

LATERAL THORAX IMPACT TEST

SIDE IMPACT DUMMY

16-APR-03

LEFT SIDE CONFIGURATION

TRC INC.

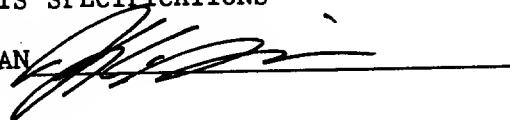
TEST NO: STL06508

572F SID SN065 L.THORAX CAL08

TEST PARAMETER	SPECIFICATION (ABSOLUTE VALUE)	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	22.2 DEG. C
RELATIVE HUMIDITY	10 - 70 %	41.0 %
PENDULUM VELOCITY	4.21 - 4.33 M/S	4.30 M/S
PEAK ACCELERATION: UPPER RIB BAR	37 - 46 G	43.2 G
PEAK ACCELERATION: LOWER RIB BAR	37 - 46 G	39.7 G
PEAK ACCELERATION: LOWER THORACIC SPINE	15 - 22 G	19.6 G

TEST MEETS SPECIFICATIONS

TECHNICIAN



RUN NUMBER: 041603.1118;1

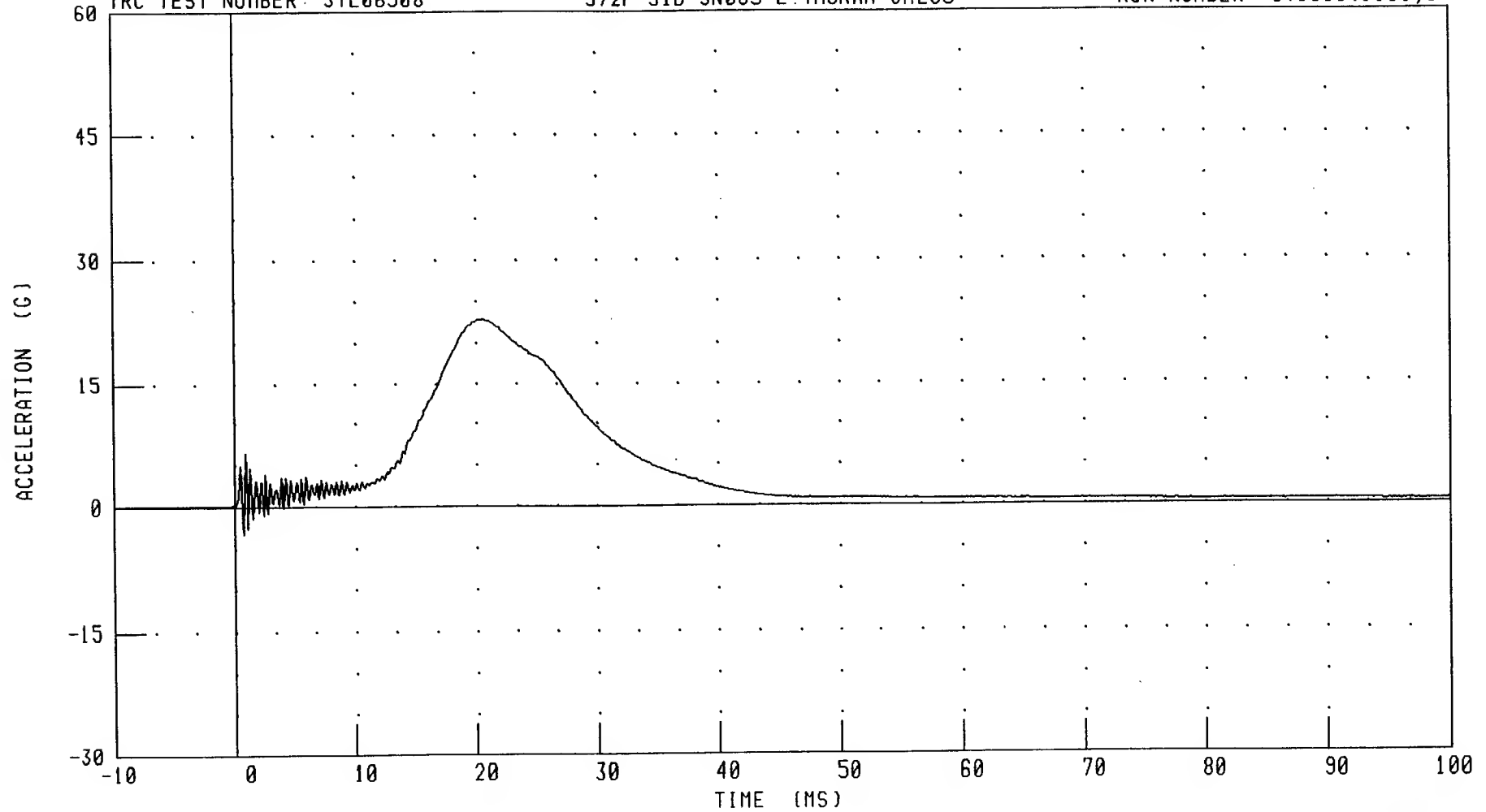
PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)

PENDULUM DECELERATION

TRC TEST NUMBER: STL06508

572F SID SN065 L THORAX CAL08

RUN NUMBER: 041603.1118;1



CHANNEL: PENXC

FILTER: CH. CLASS 1000

PEAK DATA: 22.90 G @ 20.64 MS; -3.34 G @ 0.72 MS

C-20

030422-1

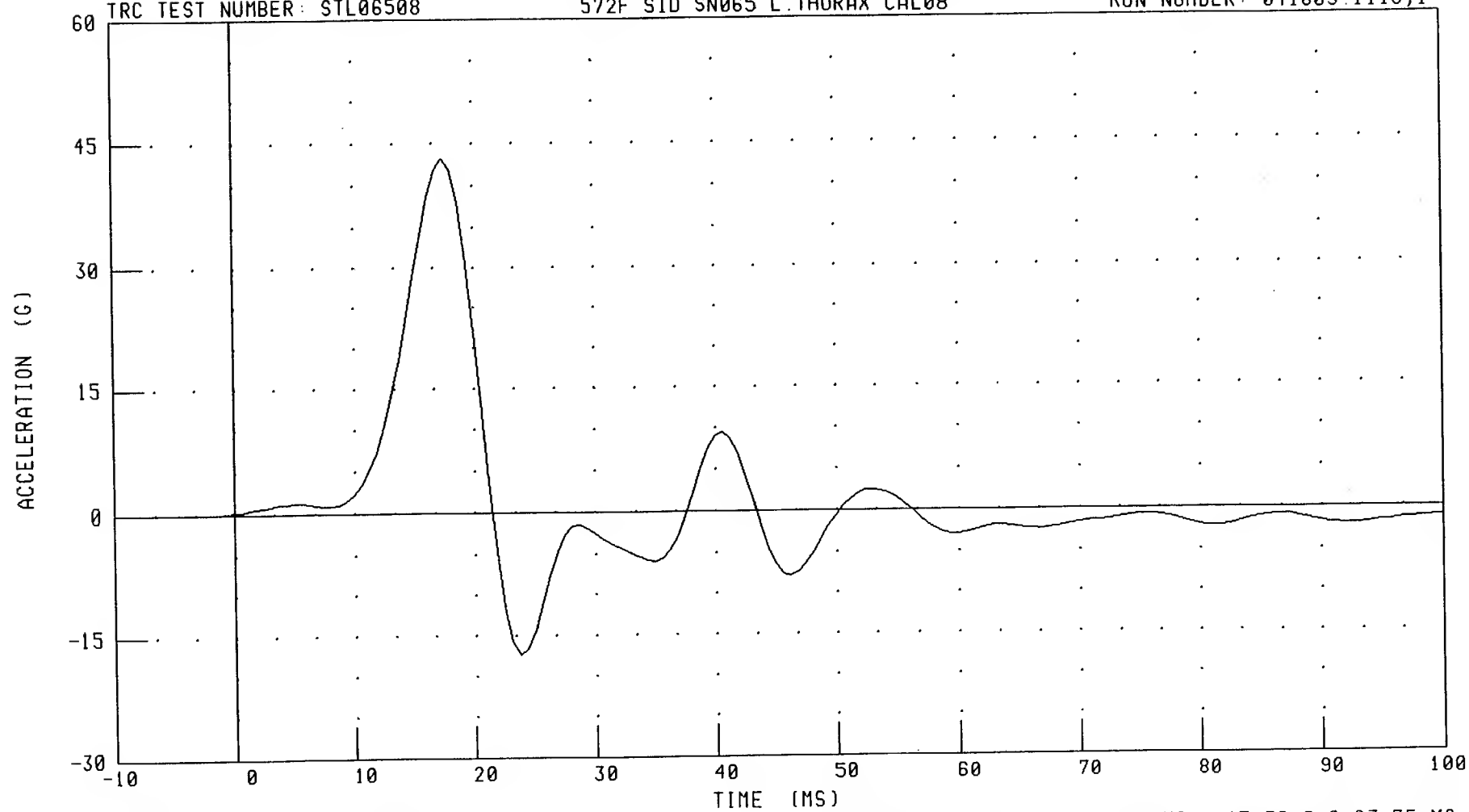
PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)

LEFT UPPER RIB ACCELERATION Y AXIS

TRC TEST NUMBER: STL06508

572F SID SN065 L.THORAX CAL08

RUN NUMBER: 041603.1118;1



CHANNEL: LURYG

FILTER: FIR 100

PEAK DATA: 43.18 G @ 17.50 MS; -17.39 G @ 23.75 MS

030422-1

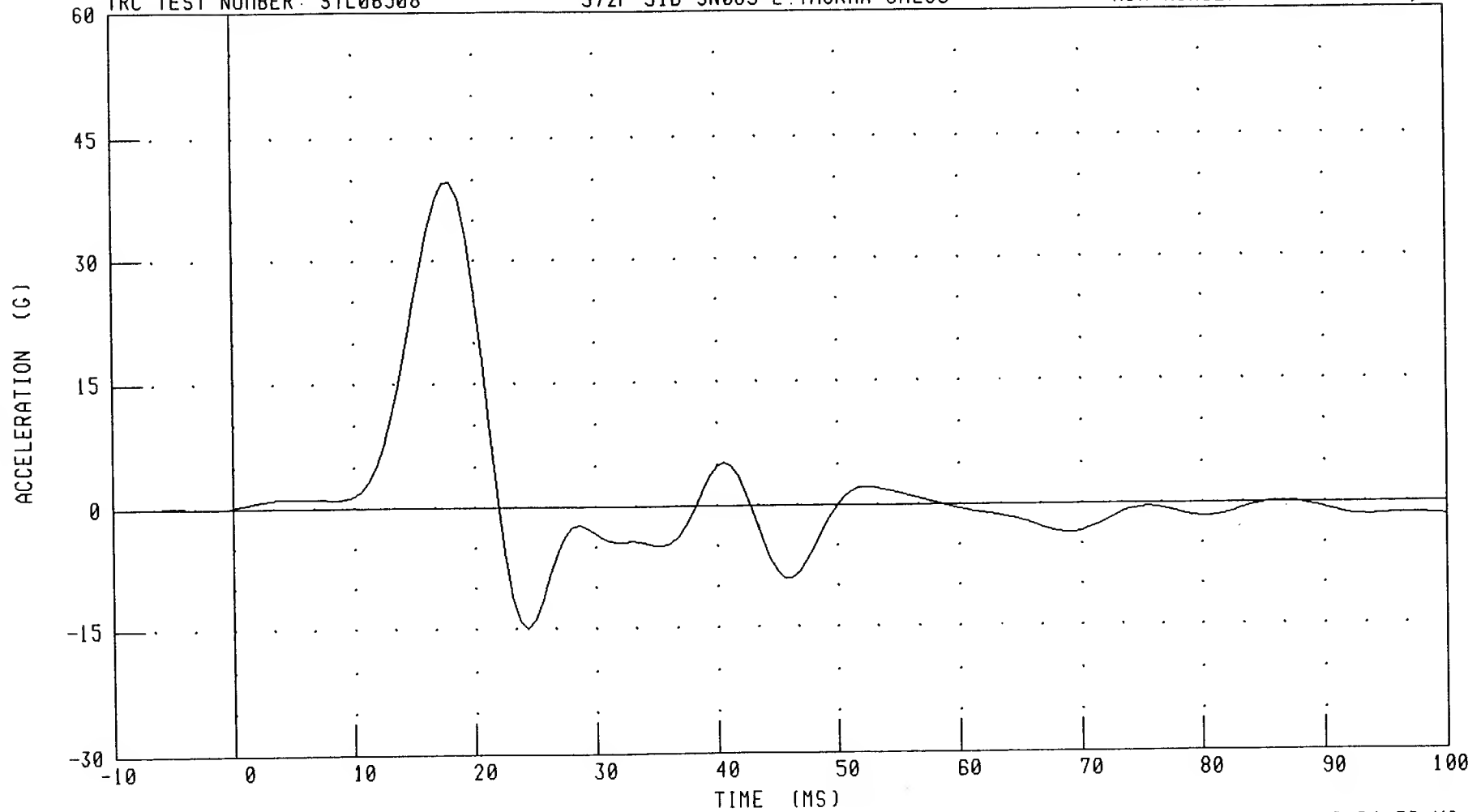
PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)

LEFT LOWER RIB ACCELERATION Y AXIS

TRC TEST NUMBER: STL06508

572F SID SN065 L THORAX CAL08

RUN NUMBER: 041603.1118;1



CHANNEL: LLRYG

FILTER: FIR 100

PEAK DATA: 39.72 G @ 18.13 MS; -14.99 G @ 24.38 MS

030422-1

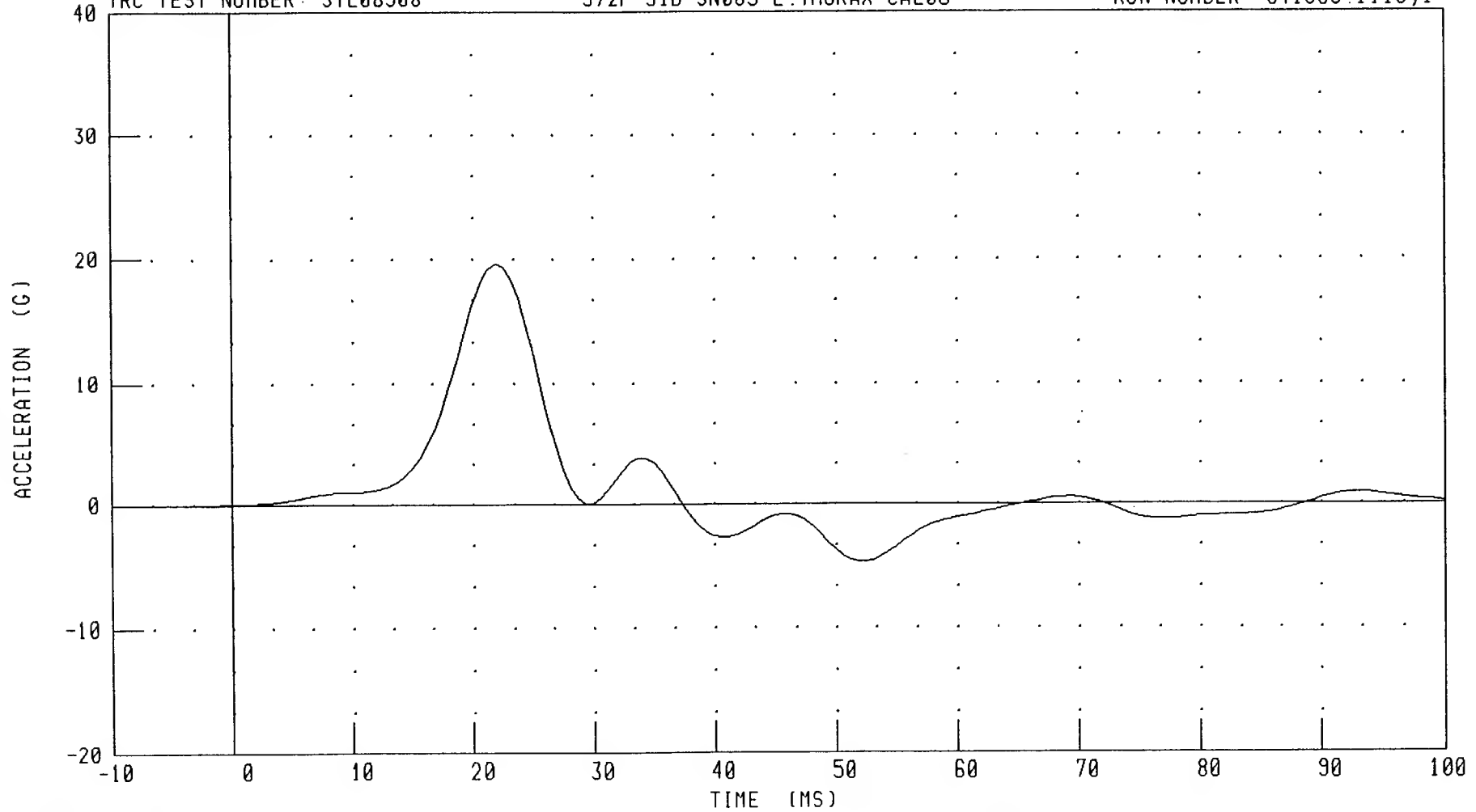
PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)

LOWER SPINE ACCELERATION Y AXIS

TRC TEST NUMBER: STL06508

572F SID SN065 L.THORAX CAL08

RUN NUMBER: 041603.1118;1



030422-1

TRANSPORTATION RESEARCH CENTER INC.

THORACIC SHOCK ABSORBER TESTS

SIDE IMPACT DUMMY

17-APR-03

TRC INC.

572F SN065 DAMPER TEST CAL08


TEST NUMBERS: DP06508A, DP06508B, DP06508C

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		18.9 - 25.5 C	21.7 DEG. C
RELATIVE HUMIDITY		10 - 70 %	38.0 %
VELOCITY	FORCE	683 - 944 N	840 N
	DISPLACEMENT	29.8 - 34.6 MM	32.2 MM
2.78 M/S	FORCE	1733 - 2100 N	2005 N
	DISPLACEMENT	31.6 - 37.2 MM	34.4 MM
VELOCITY	FORCE	3824 - 4542 N	4040 N
	DISPLACEMENT	33.3 - 39.6 MM	38.4 MM
6.14 M/S	FORCE		
	DISPLACEMENT		

DAMPER SETTING = 5.5

TEST MEETS SPECIFICATIONS

TECHNICIAN



RUN NUMBER: 041703.1401;1

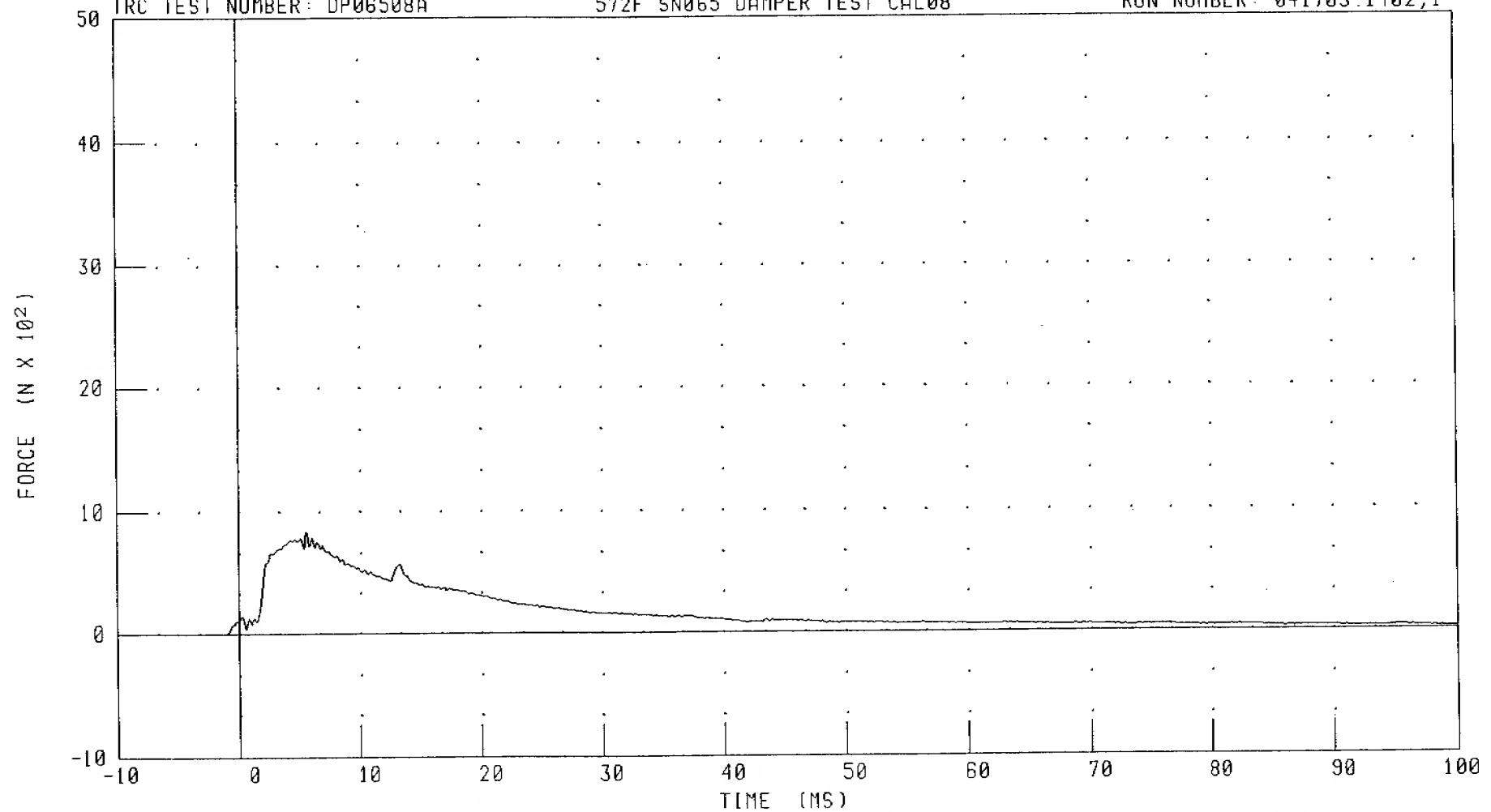
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (3.0 M/SEC)

SHOCK ABSORBER RESISTIVE FORCE

TRC TEST NUMBER: DP06508A

572F SN065 DAMPER TEST CAL08

RUN NUMBER: 041703.1402;1



CHANNEL: DAMPF

FILTER: CH. CLASS 1000

C-25

030422-1

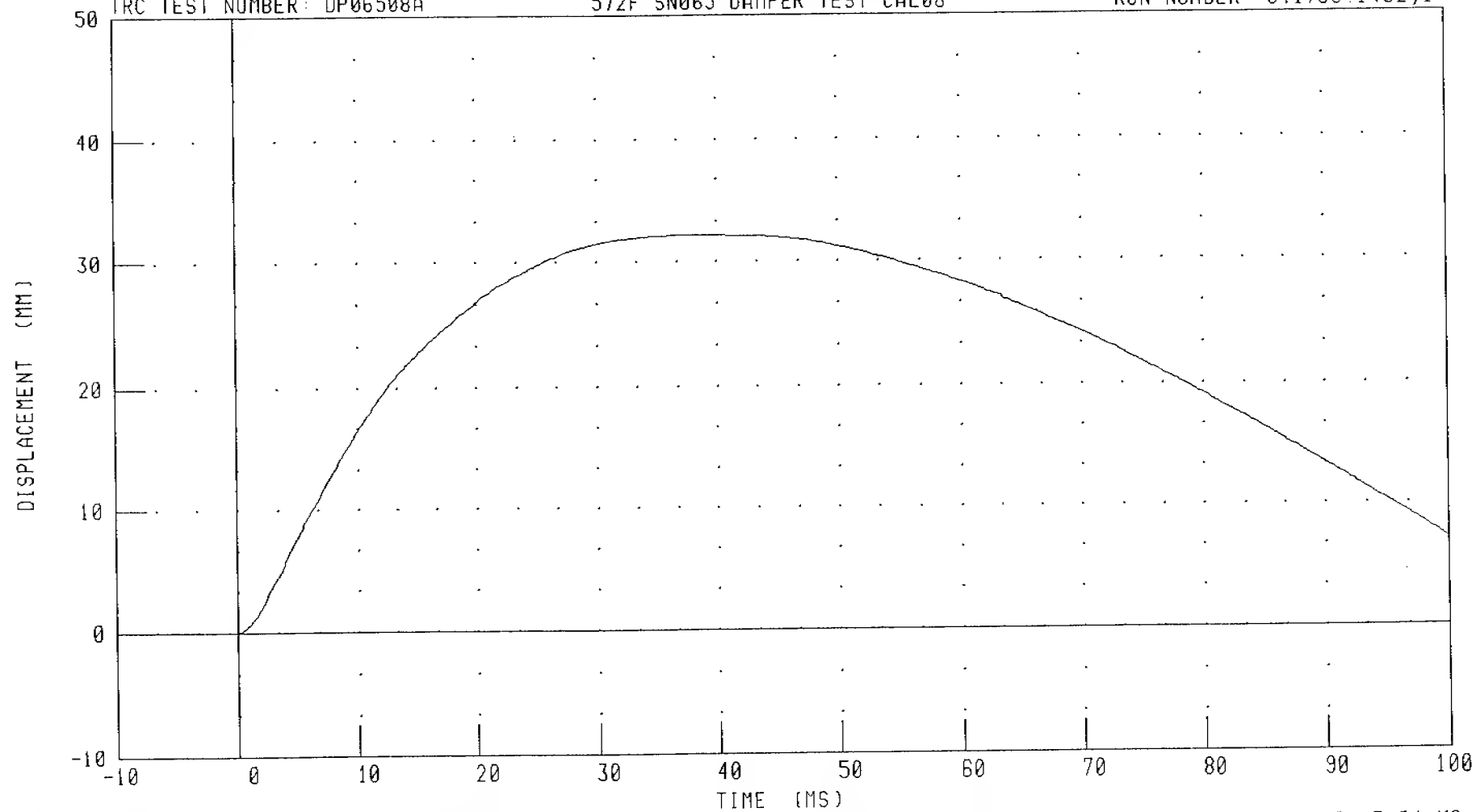
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (3.0 M/SEC)

SHOCK ABSORBER DISPLACEMENT

TRC TEST NUMBER: DP06508A

572F SN065 DAMPER TEST CAL08

RUN NUMBER: 041703.1402;1



CHANNEL: CSTYD

FILTER: CH. CLASS 1000

PEAK DATA: 32.15 MM @ 36.88 MS; 0.00 MM @ -3.84 MS

C-26

030422-1

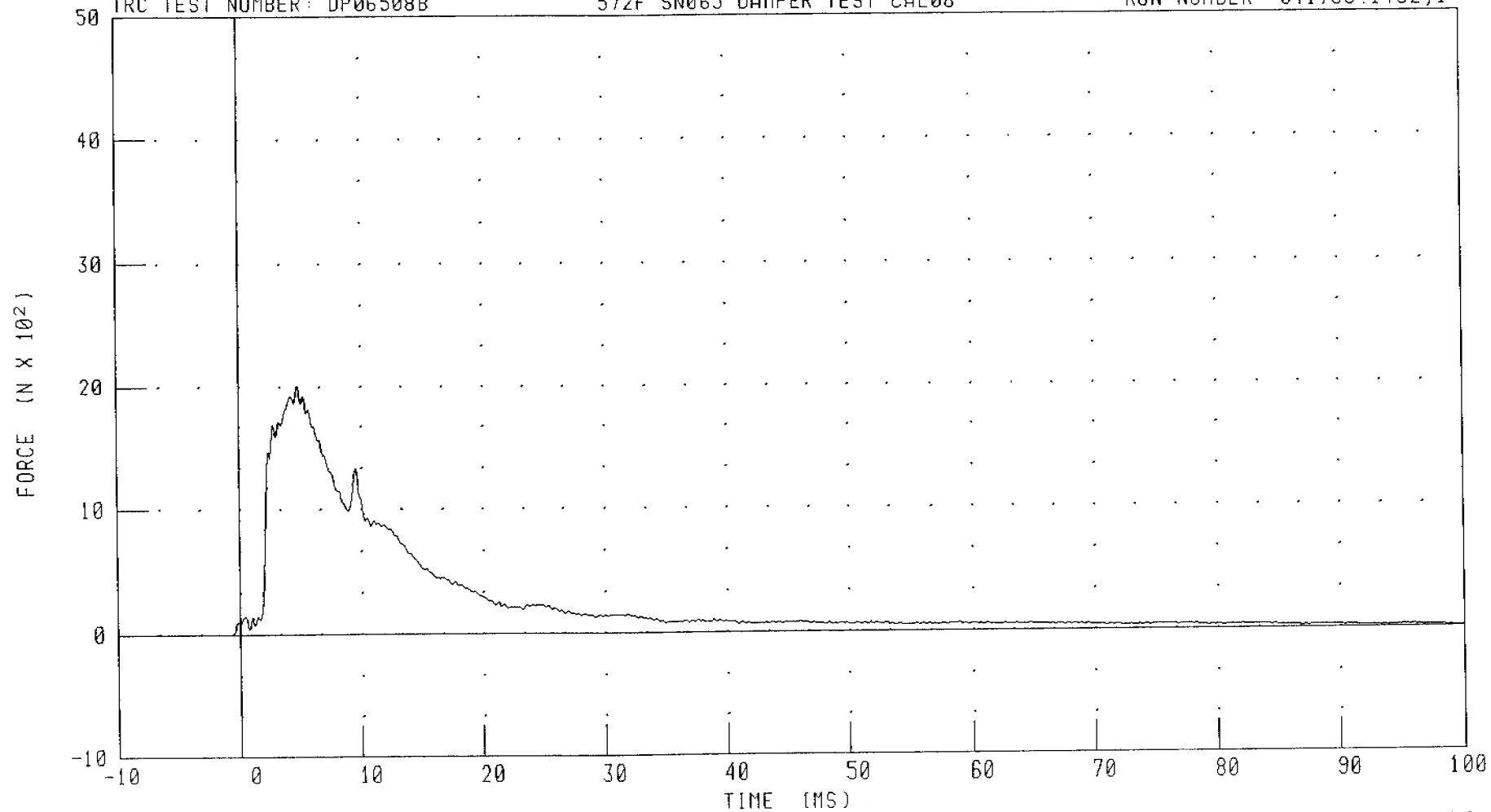
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (4.3 M/SEC)

SHOCK ABSORBER RESISTIVE FORCE

TRC TEST NUMBER: DP06508B

572F SN065 DAMPER TEST CAL08

RUN NUMBER: 041703.1402;1



CHANNEL: DAMPF

FILTER: CH. CLASS 1000

PEAK DATA: 2004 54 N @ 4.88 MS; -2 26 N @ -6 80 MS

030422-1

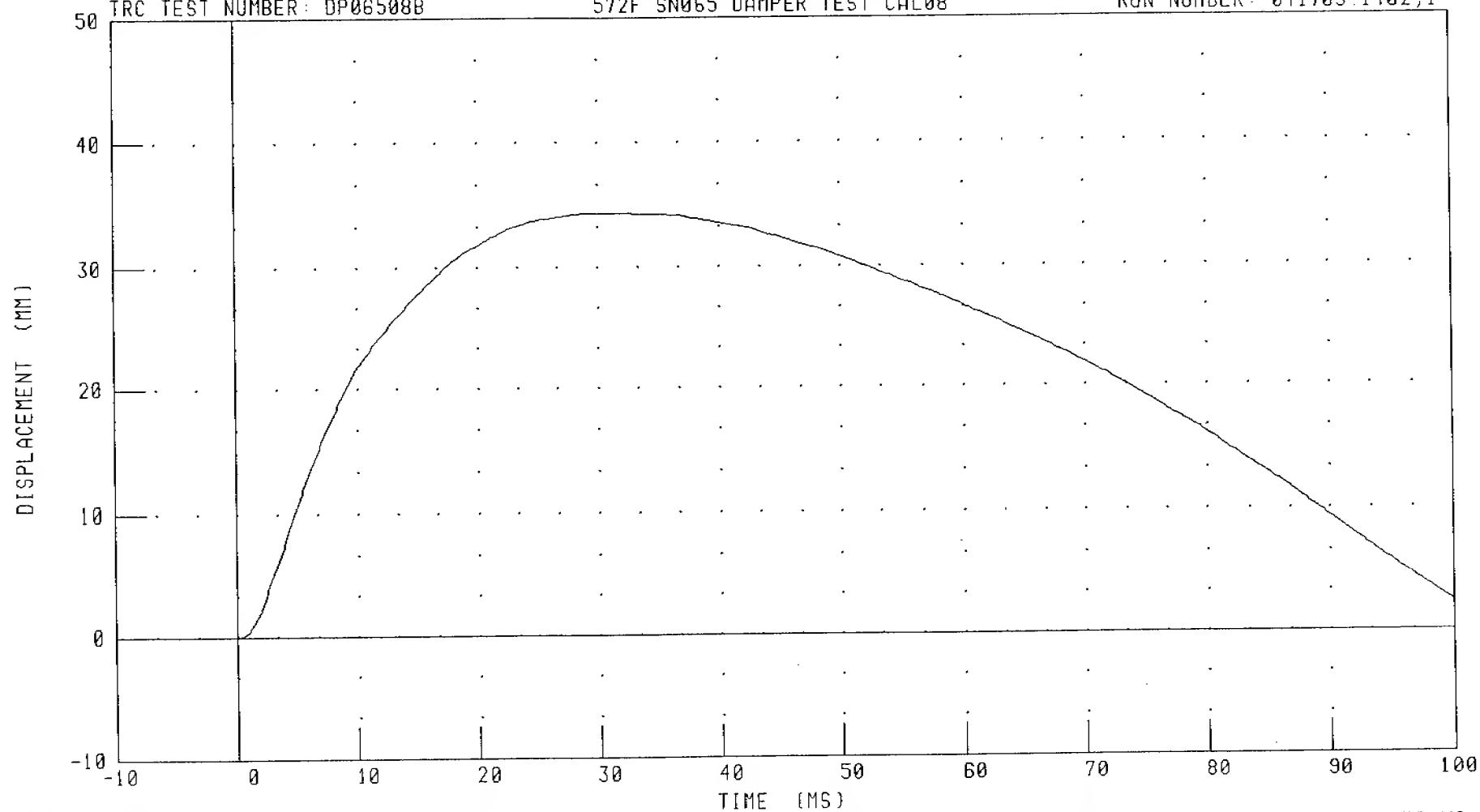
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (4.3 M/SEC)

SHOCK ABSORBER DISPLACEMENT

TRC TEST NUMBER: DP06508B

572F SN065 DAMPER TEST CAL08

RUN NUMBER: 041703.1402;1



CHANNEL: CSTYD

FILTER: CH. CLASS 1000

PEAK DATA: 34.36 MM @ 30.64 MS; 0.00 MM @ -9.52 MS

030422-1

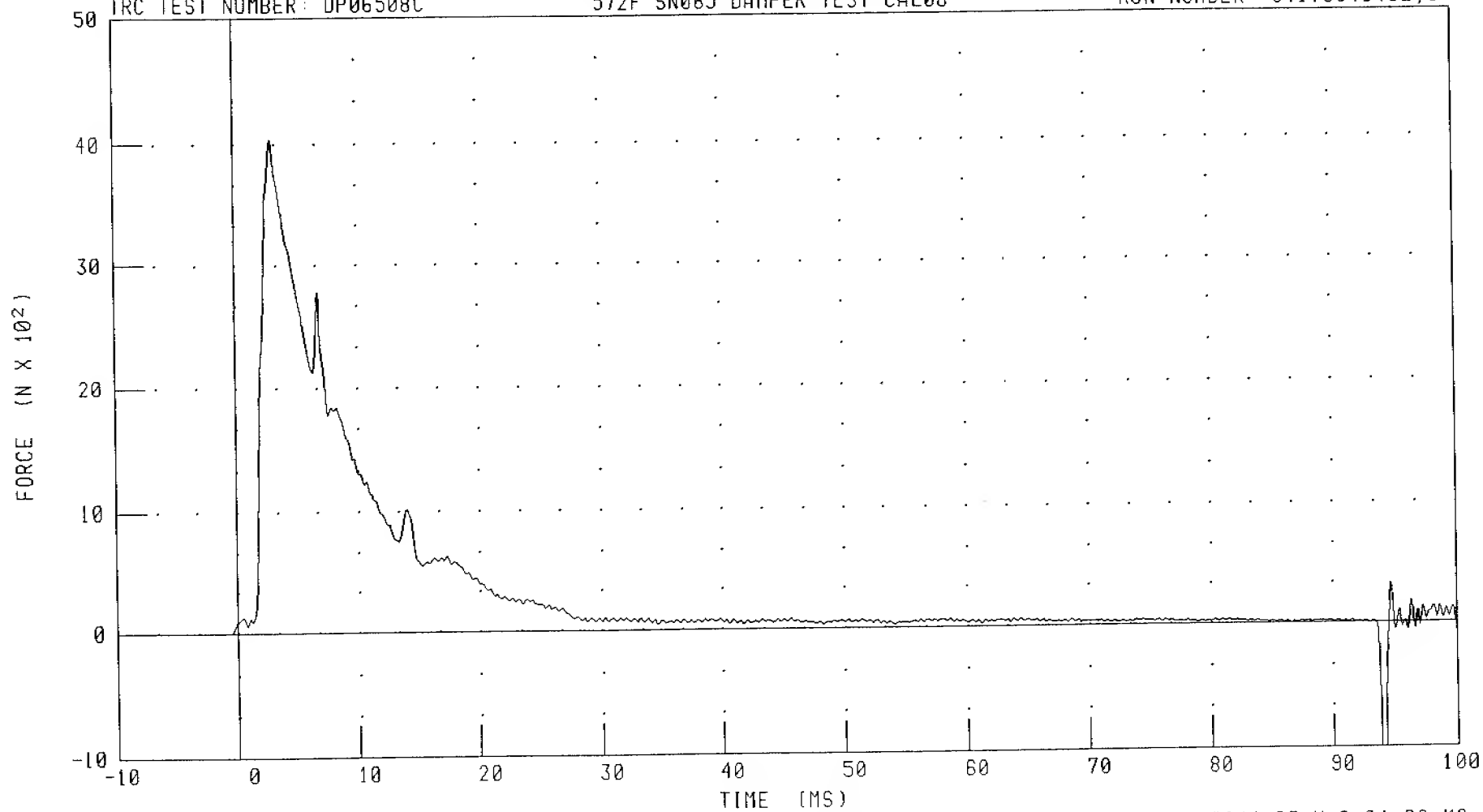
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (6.1 M/SEC)

SHOCK ABSORBER RESISTIVE FORCE

TRC TEST NUMBER: DP06508C

572F SN065 DAMPER TEST CAL08

RUN NUMBER: 041703.1402;1



CHANNEL: DAMPF

FILTER: CH. CLASS 1000

PEAK DATA: 4040.25 N @ 3.04 MS; -2244.23 N @ 94.08 MS

C-29

030422-1

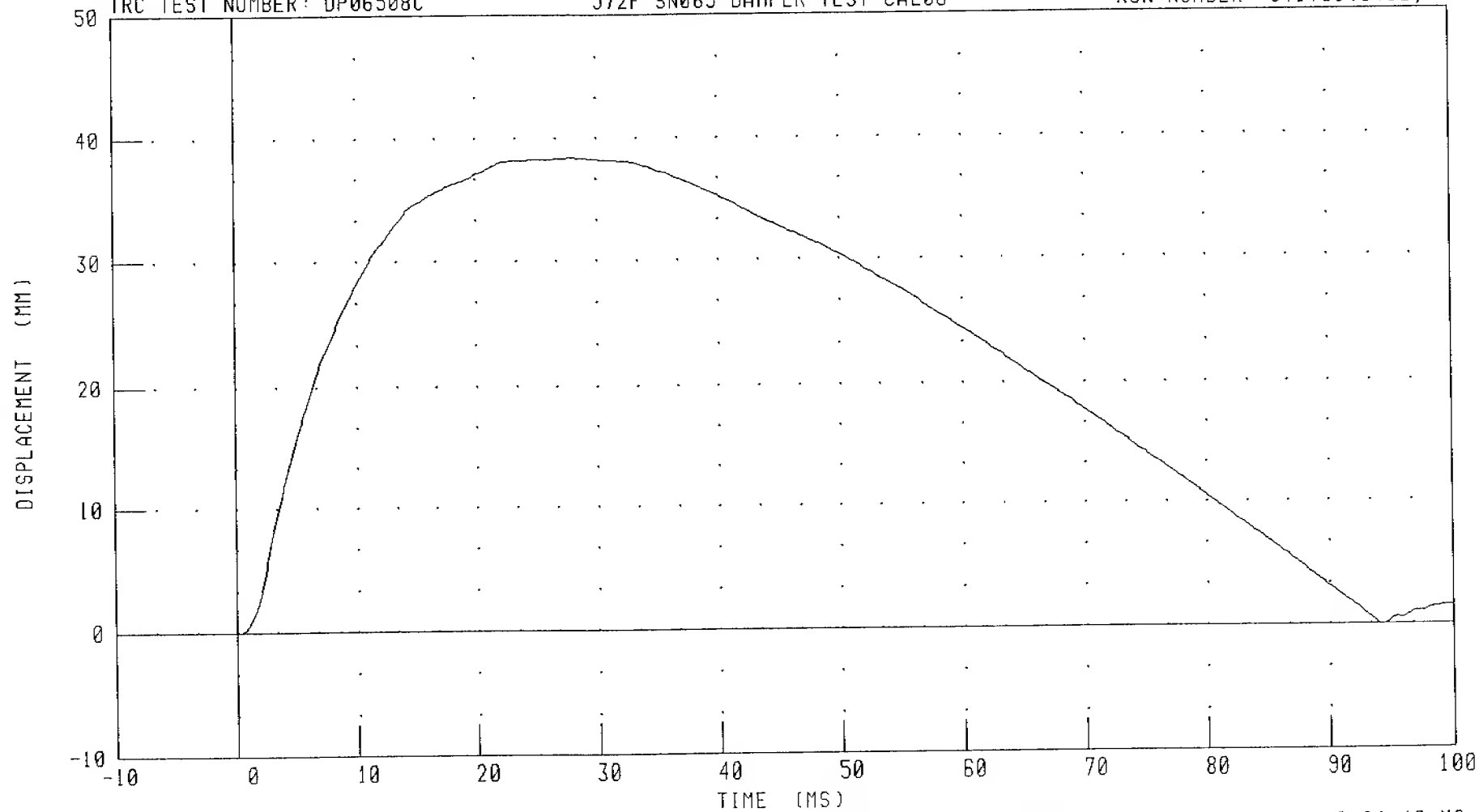
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (6.1 M/SEC)

SHOCK ABSORBER DISPLACEMENT

572F SN065 DAMPER TEST CAL08

RUN NUMBER: 041703.1402;1

TRC TEST NUMBER: DP06508C



CHANNEL: CSTYD

FILTER: CH. CLASS 1000

PEAK DATA: 38.39 MM @ 27.84 MS; -0.02 MM @ 94.40 MS

030422-1

Transportation Research Center Inc.

572B Abdomen Compression Test

IIII SID Serial No. 065 Calibration No. 08 - 1

Test Date 04/16/2003

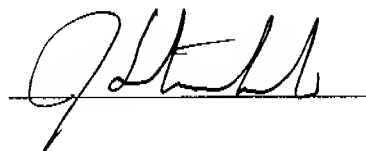
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	22.2 °C	Yes
Relative Humidity	10 - 70 %	40 %	Yes
Displacement Rate	6.35 - 8.89 mm/s	7.3 - 8.1 mm/s	Yes
Data Within Required Corridor	Yes	Yes	Yes

Comments:

Technician



Approved



04.18.2003 09:08:28 260

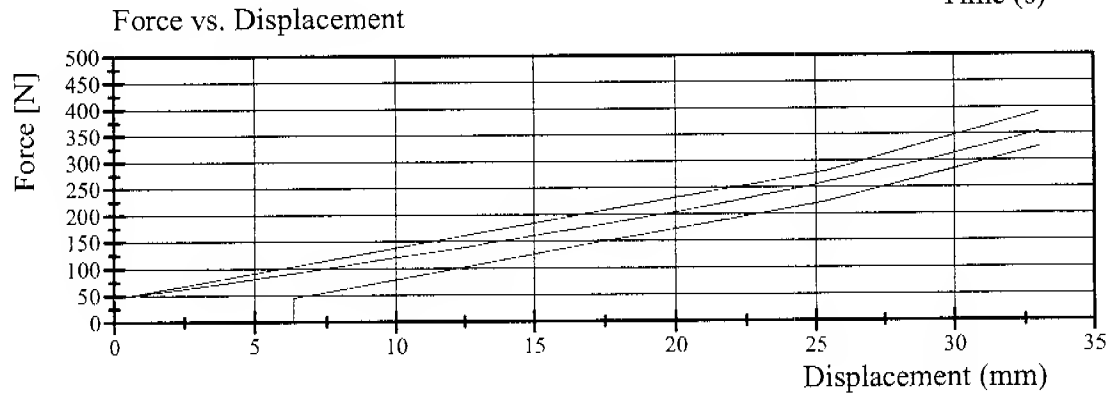
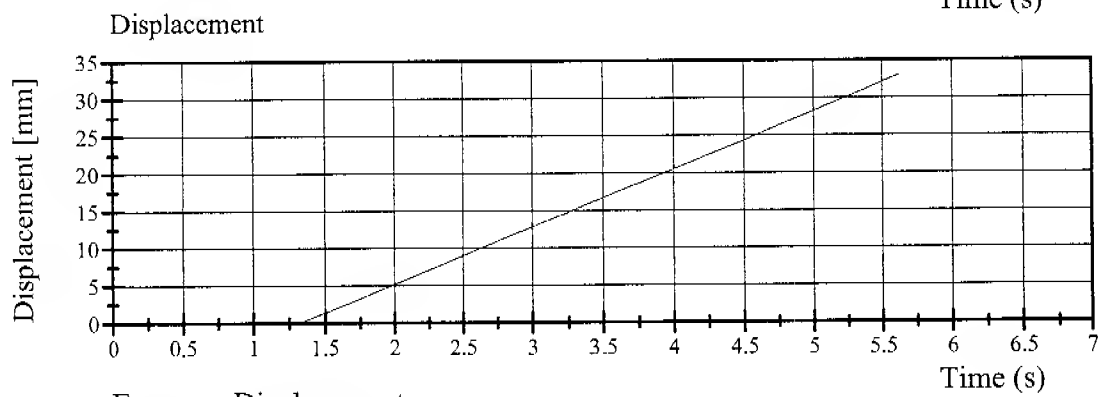
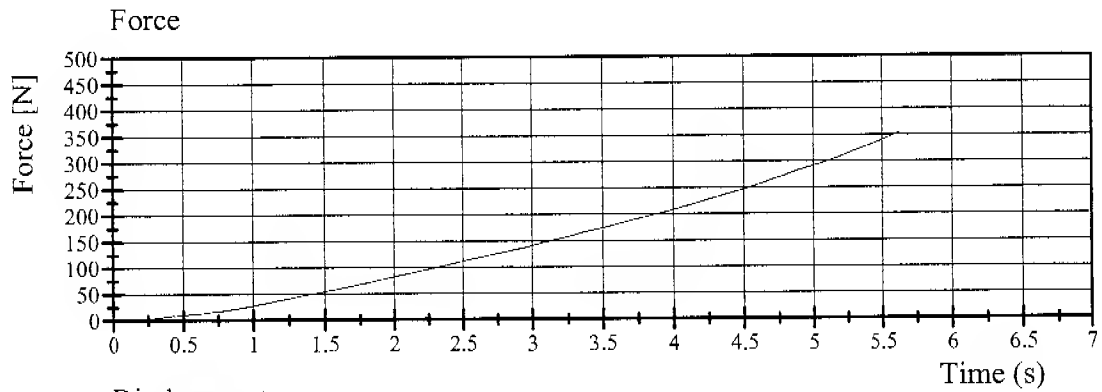


Transportation Research Center Inc.

572B Abdomen Compression Test

HIII SID Serial No. 065 Calibration No. 08 - 1

Test Date 04/16/2003



04.18.2003 09:08:18 260



TRANSPORTATION RESEARCH CENTER INC.

LUMBAR FLEXION TEST

SID PART 572B

CAL DATE: 16-Apr-03

TRC, INC.

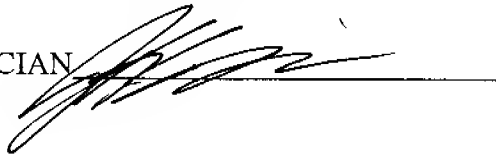
TEST NO: 065C08TF1

572B SN 065 TORSO FLEX CAL 08

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 – 25.6° C	21.9 °C
RELATIVE HUMIDITY	10 – 70 %	39 %
FORCE AT 0 DEG. FLEXION	-27 – 27 N	0 N
FORCE AT 20 DEG OF FLEXION	98 – 151 N	115.7 N
FORCE AT 30 DEG OF FLEXION	151 – 205 N	160.2 N
FORCE AT 40 DEG OF FLEXION	205 – 258 N	209.1 N
NET RETURN ANGLE AFTER 3 MINUTES	< 12 °	8 °

TEST MEETS SPECIFICATIONS

TECHNICIAN



TRANSPORTATION RESEARCH CENTER INC.

LATERAL PELVIS IMPACT TEST

SIDE IMPACT DUMMY

16-APR-03

LEFT SIDE CONFIGURATION

TRC INC.

TEST NO: SPL06508

572F SN065 LEFT PELVIS CAL08

TEST PARAMETER	SPECIFICATION (ABSOLUTE VALUE)	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	22.2 DEG. C
RELATIVE HUMIDITY	10 - 70 %	41.0 %
PENDULUM VELOCITY	4.21 - 4.33 M/S	4.25 M/S
PEAK PELVIC ACCELERATION	40 - 60 G	53.5 G
TIME ABOVE 20 G LEVEL	3 - 7 MS	5.8 MS
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN



RUN NUMBER: 041603.1109;1

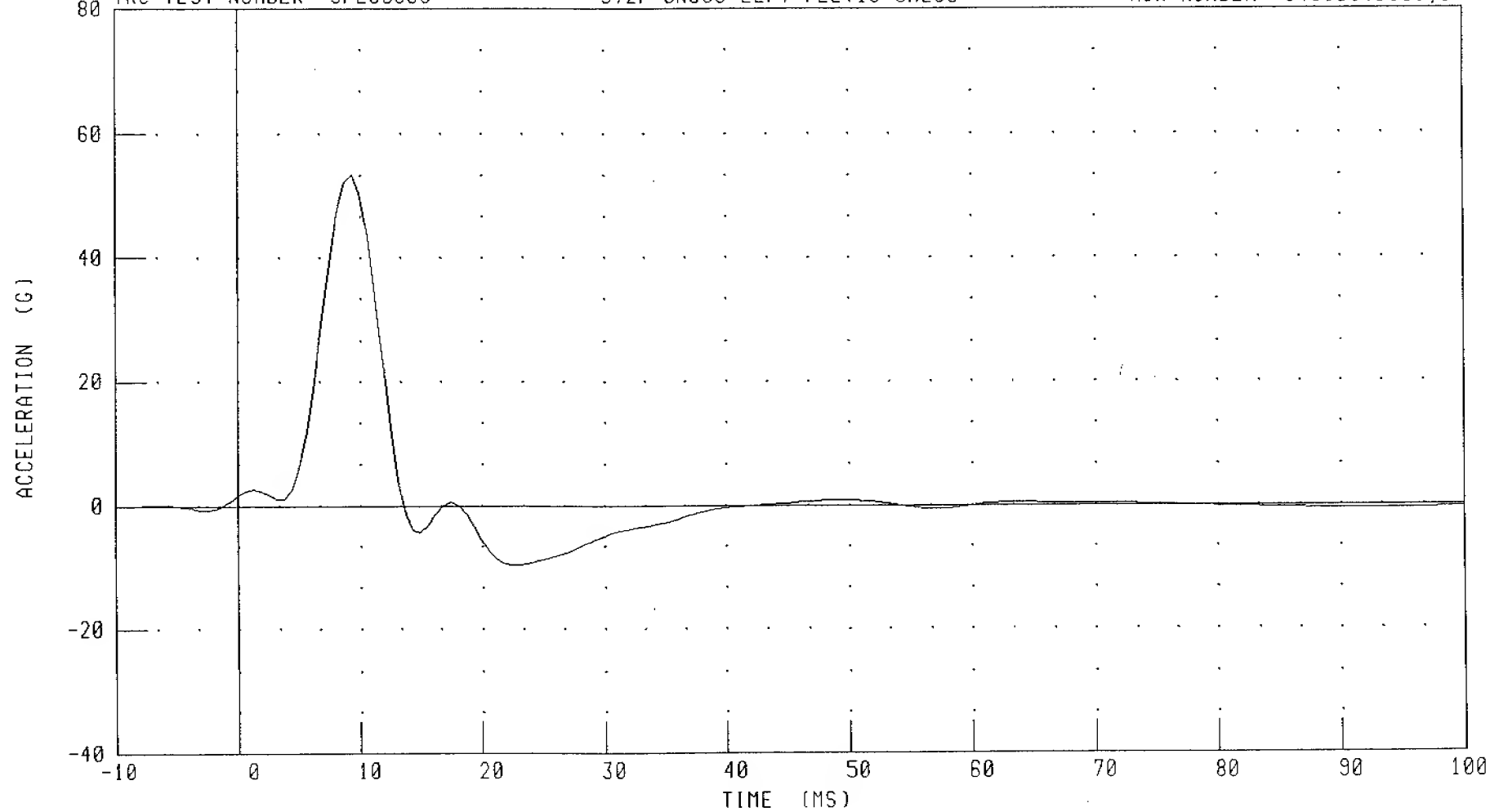
PART 572-F S.I.D. PELVIS CALIBRATION - (LEFT SIDE IMPACT)

PELVIS ACCELERATION Y AXIS

TRC TEST NUMBER: SPL06508

572F SN065 LEFT PELVIS CAL08

RUN NUMBER: 041603.1110,1



CHANNEL: PEVYG

FILTER: FIR 100

PEAK DATA: 53.51 G @ 9.37 MS; -9.78 G @ 22.50 MS

C-35

030422-1

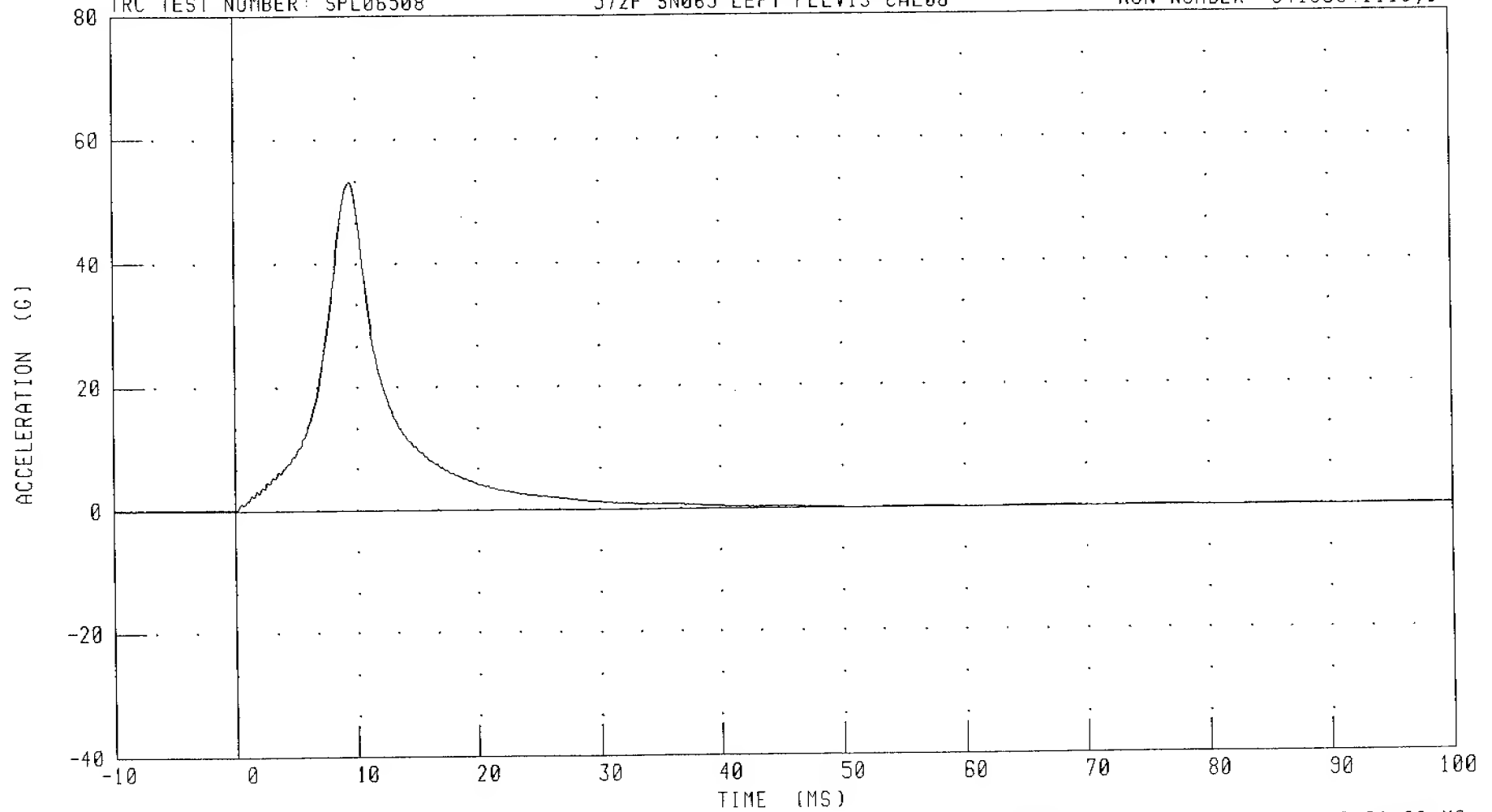
PART 572-F S.I.D. PELVIS CALIBRATION - (LEFT SIDE IMPACT)

PENDULUM DECELERATION

TRC TEST NUMBER: SPL08508

572F SN065 LEFT PELVIS CAL08

RUN NUMBER: 041603.1110;1



CHANNEL: PENXG FILTER: CH. CLASS 1000

PEAK DATA: 53.29 G @ 9.52 MS; -0.11 G @ 81.60 MS

030422-1

Calibration Test Results

Pre-Test

SID-H3: 066


Configured for Left Side Impact

External Dimensions:	The dummy passed all external dimension requirements.
Lateral Head Drop Test:	The head passed all lateral drop test requirements.
Lateral Neck Test:	The neck passed all impact test requirements.
Lateral Thorax Impact Test:	The thorax passed all impact test requirements.
Thoracic Shock Absorber Test:	The thoracic shock absorber passed all test requirements (tested on February 3, 2003 for a previous calibration series).
Lumbar Flexion Test:	The dummy met the lumbar flexion test requirements.
Abdominal Compression Test:	The abdomen met the compression test requirements.
Pelvis Impact Test:	The lateral pelvis passed all impact test requirements.

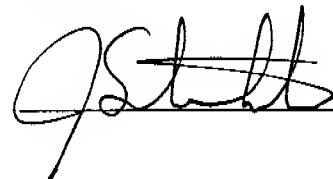
Transportation Research Center Inc.
572F SID Dummy
External Dimensions
Serial No. 066 Calibration No. 07

Test Parameter	Dimension	Specification	Results	Pass
Seated Height	SH	889.0 - 909.3 mm	903 mm	Yes
Rib Height	RH	501.7 - 520.7 mm	508 mm	Yes
Hip Pivot Height	HP	99.1 REF mm	99.1 mm	
Rib From Backline	RD	228.6 - 241.3 mm	237 mm	Yes
Knee Pivot From Backline	KH	510.5 - 525.8 mm	519 mm	Yes
Knee Pivot From Floor	KV	490.2 - 505.5 mm	498 mm	Yes
Hip Width	HW	355.6 - 391.2 mm	388 mm	Yes
Top Rib Width From CL	RW-1	165.1 - 180.3 mm	171 mm	Yes
Bottom Rib Width From CL	RW-2	165.1 - 180.3 mm	170 mm	Yes
Difference Between Top & Bottom Rib Width from CL		<= 2.5 mm	1.0 mm	Yes

Technician



Approved




TRANSPORTATION RESEARCH CENTER INC.

LATERAL HEAD DROP TEST

HYBRIDI III SID DUMMY

14-APR-03

LEFT SIDE CONFIGURATION

TRC INC.

TEST NO. HDL06607

H3/SID SN066 HEAD DROP CAL07

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.6 deg. C	21.67 deg. C
RELATIVE HUMIDITY	10 - 70 %	38.00 %
PEAK RESULTANT ACCELERATION	120 - 150 G	147.32 G
PEAK LONGITUDINAL ACCELERATION	15 G MAX	-5.50 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

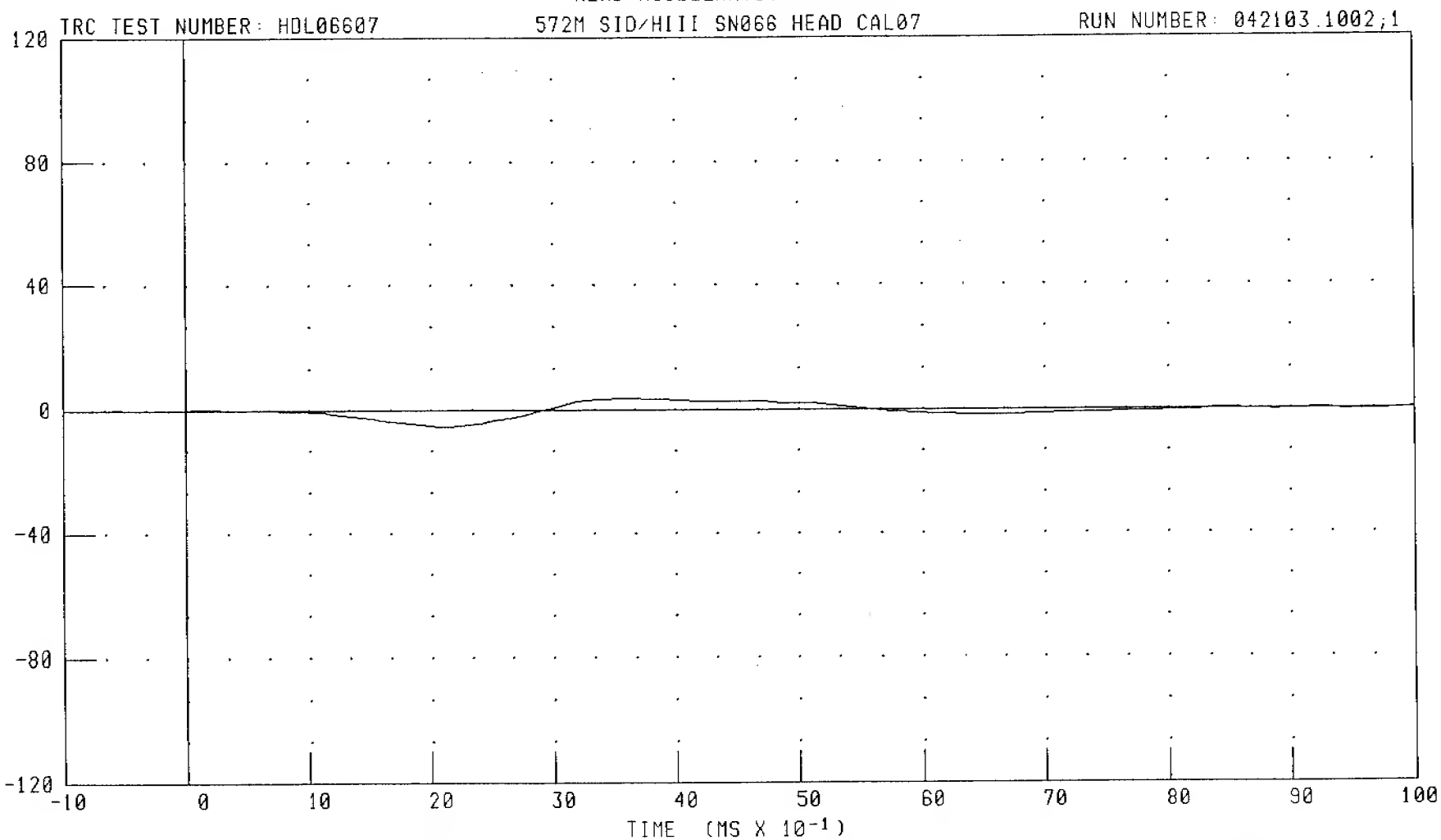
TEST MEETS SPECIFICATIONS

TECHNICIAN 

RUN NUMBER: 041403.1235;1

572M SID/HIII DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD ACCELERATION X AXIS

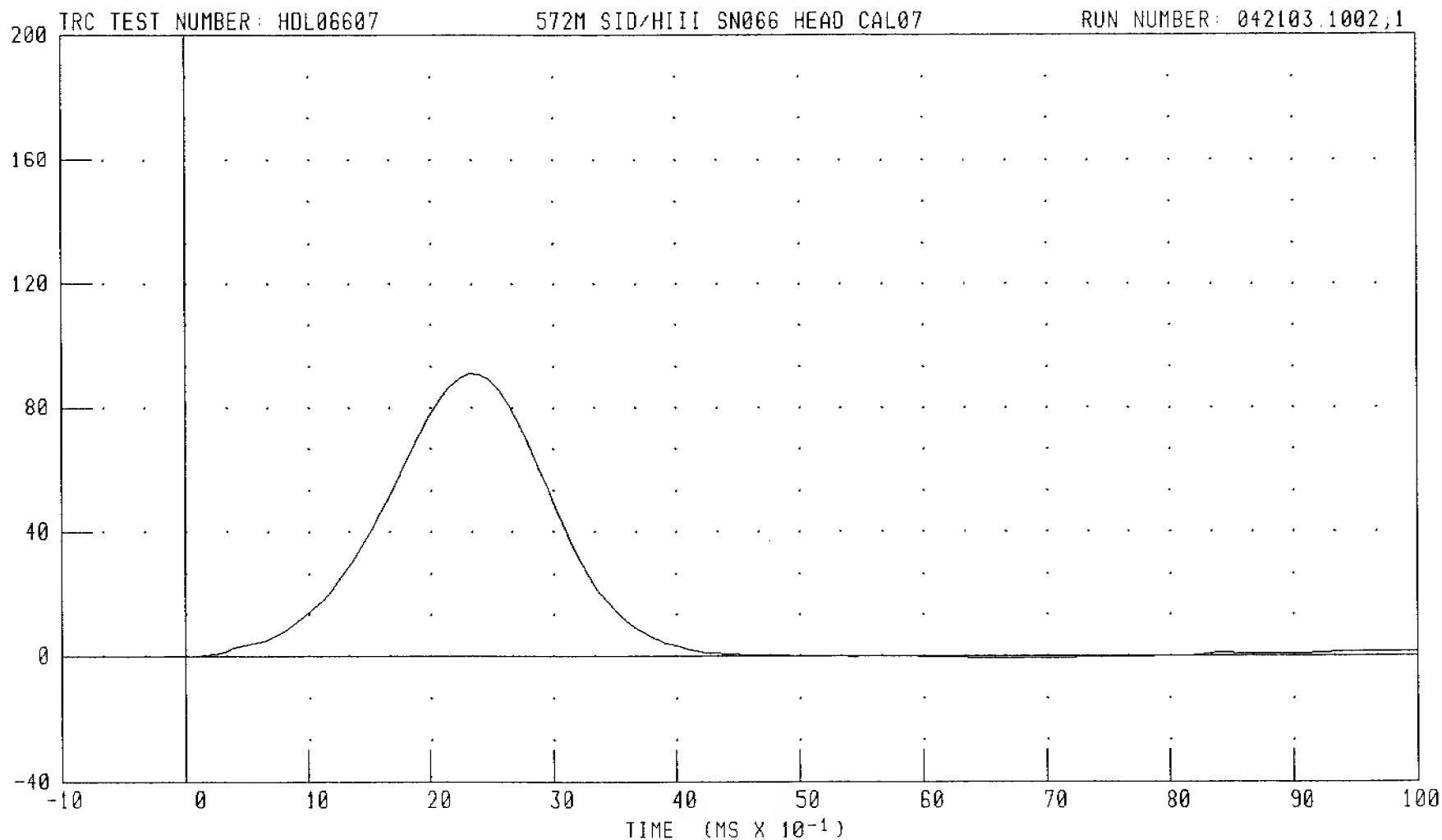


C-40

030422-1

572M SID/HIII DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD ACCELERATION Y AXIS



CHANNEL: HEDYG

FILTER: CH. CLASS 1000

PEAK DATA: 90.92 G @ 2.32 MS; -0.86 G @ 6.96 MS

C-41

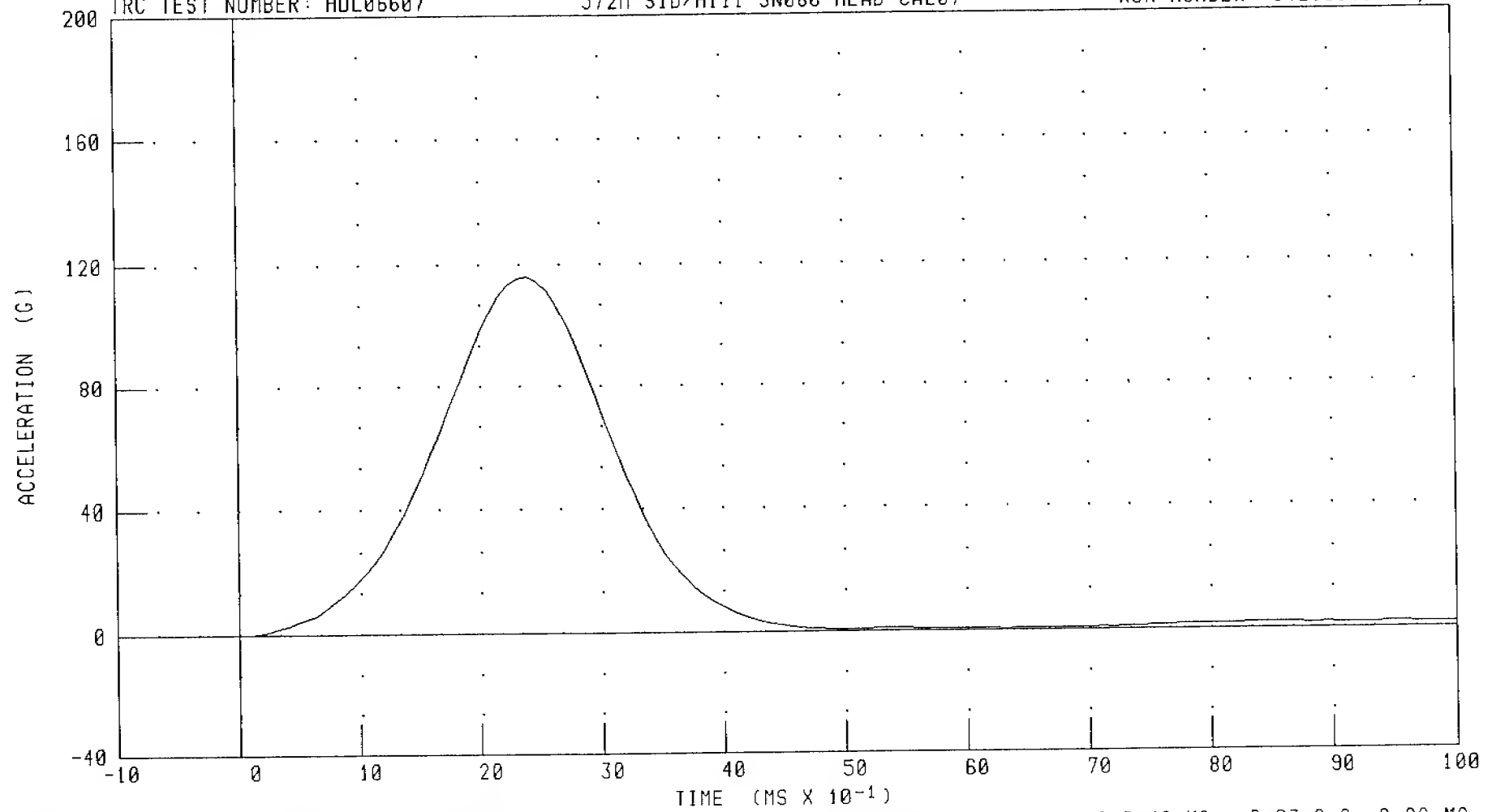
030422-1

572M SID/HIII DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP
HEAD ACCELERATION Z AXIS

TRC TEST NUMBER: HDL06607

572M SID/HIII SN066 HEAD CAL07

RUN NUMBER: 042103.1002;1



CHANNEL: HEDZG

FILTER: CH. CLASS 1000

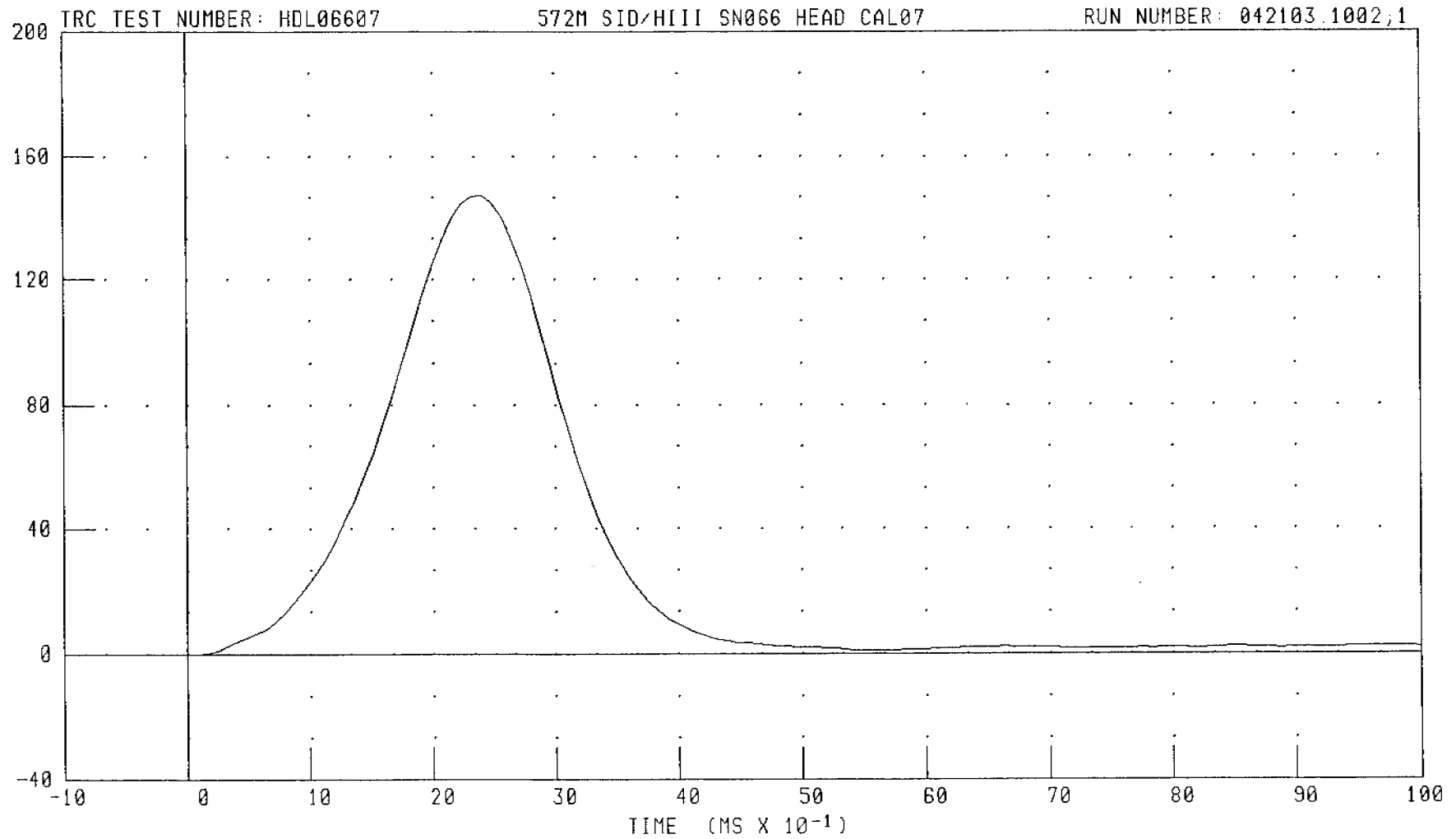
PEAK DATA: 115.98 G @ 2.40 MS; -0.03 G @ -0.96 MS

C-42

030422-1

572M SID/HIII DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD RESULTANT ACCELERATION



CHANNEL: HEDRG

FILTER: CH. CLASS 1000

PEAK DATA: 147.32 G @ 240 MS; 0.03 G @ 0.00 MS

C-43

030422-1

TRANSPORTATION RESEARCH CENTER INC.

LATERAL NECK TEST

HYBRIDIII SID DUMMY

14-APR-03

LEFT SIDE CONFIGURATION

TRC INC.

TEST NO. NFL06607

H3/SID SN066 NECK LEFT CAL07

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 deg. C	21.67 deg. C
RELATIVE HUMIDITY		10 - 70 %	37.00 %
IMPACT VELOCITY		6.89 - 7.13 M/S	7.06 M/S
INTEGRATED VELOCITY	10 MS	1.96 - 2.55 M/S	2.44 M/S
	20 MS	4.12 - 5.10 M/S	4.86 M/S
	30 MS	5.73 - 7.01 M/S	6.78 M/S
	40 - 70 MS	6.27 - 7.64 M/S	7.11- 7.19 M/S
MAXIMUM MIDSAGGITAL PLANE ROTATION		62 - 86 deg.	71.63 deg.
ROTATION ANGLE DECAY TIME FROM PEAK TO ZERO		58 - 67 MS	61.68 MS
MAXIMUM MOMENT ABOUT OCCIPITAL CONDYLE		73 - 88 NM	77.82 NM
POSITIVE MOMENT DECAY TIME FROM PEAK TO ZERO		49 - 64 MS	57.68 MS
TIME OF MAXIMUM ROTATION AFTER MAXIMUM MOMENT		2 - 16 MS	8.40 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN

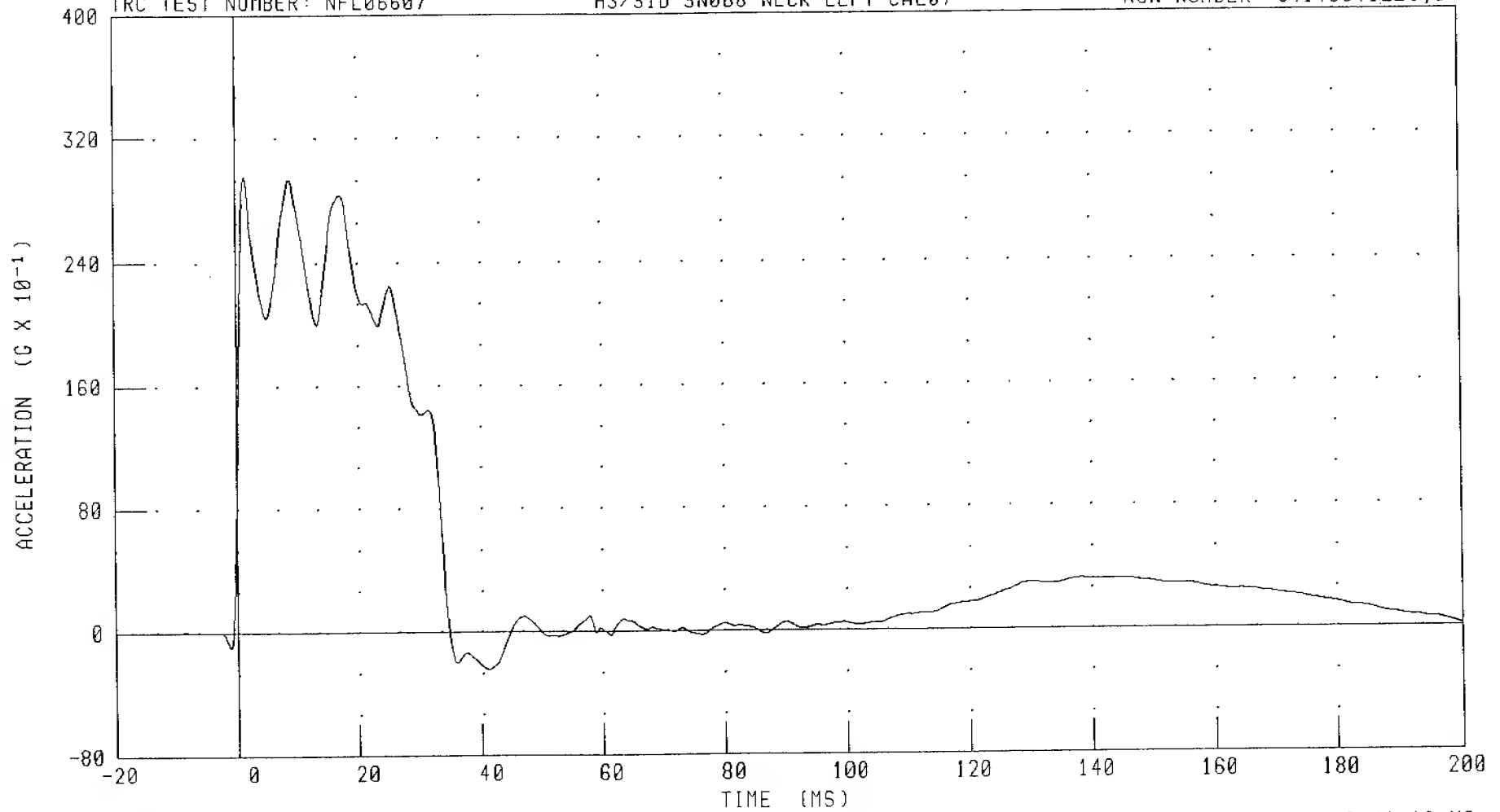
RUN NUMBER: 041403.1228;1

H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST
PENDULUM DECELERATION

TRC TEST NUMBER: NFL06607

H3/SID SN066 NECK LEFT CAL07

RUN NUMBER: 041403.1229;1



CHANNEL: PENXG

FILTER: CH. CLASS 180

PEAK DATA: 29.56 G @ 1.44 MS; -2.44 G @ 41.12 MS

030422-1

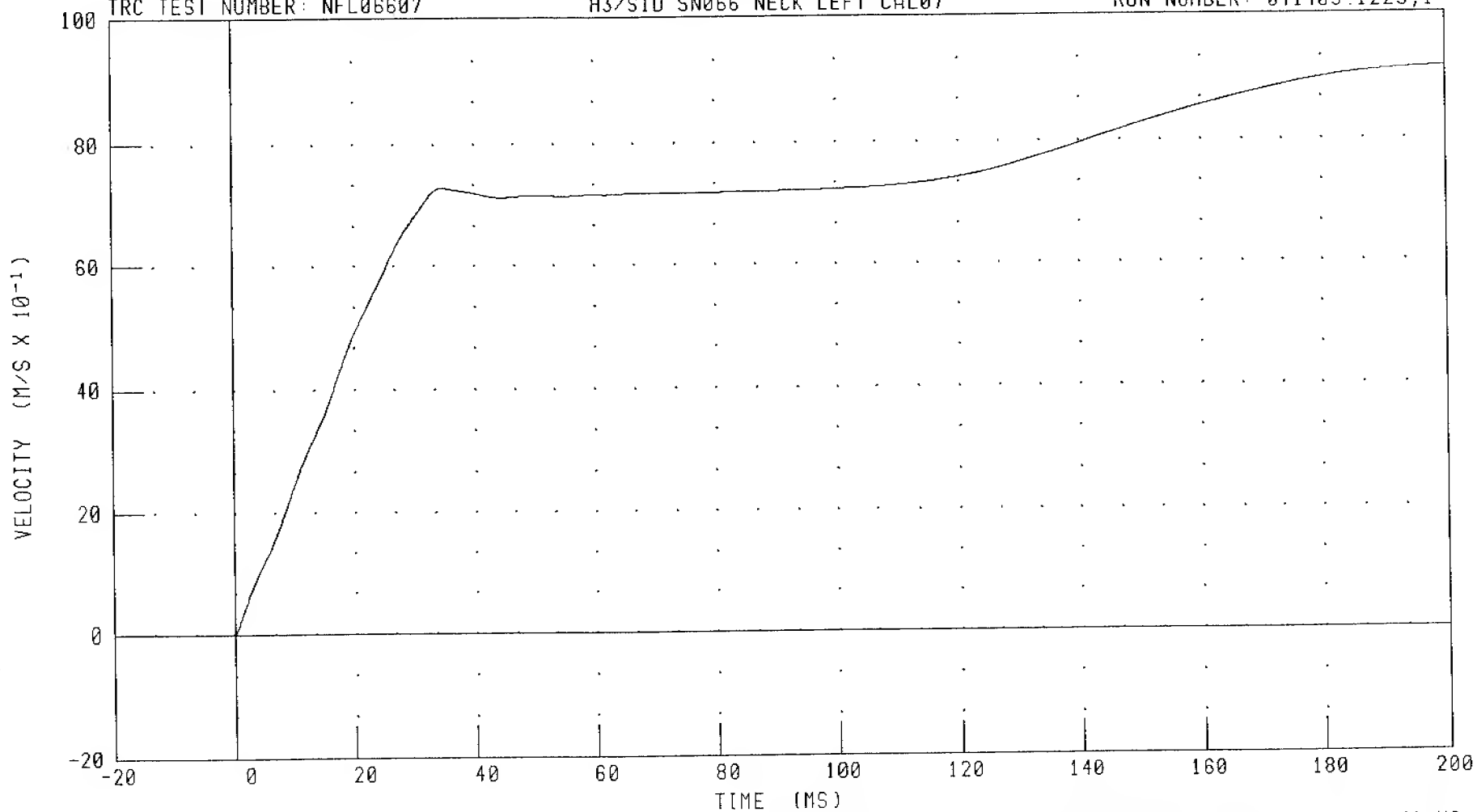
H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

INTEGRATED PENDULUM VELOCITY

H3/SID SN066 NECK LEFT CAL07

RUN NUMBER: 041403.1229;1

TRC TEST NUMBER: NFL06607



CHANNEL: PENXVI FILTER: CH CLASS 180

PEAK DATA: 9.16 M/S @ 200.00 MS; -0.01 M/S @ -0.72 MS

C-46

030422-1

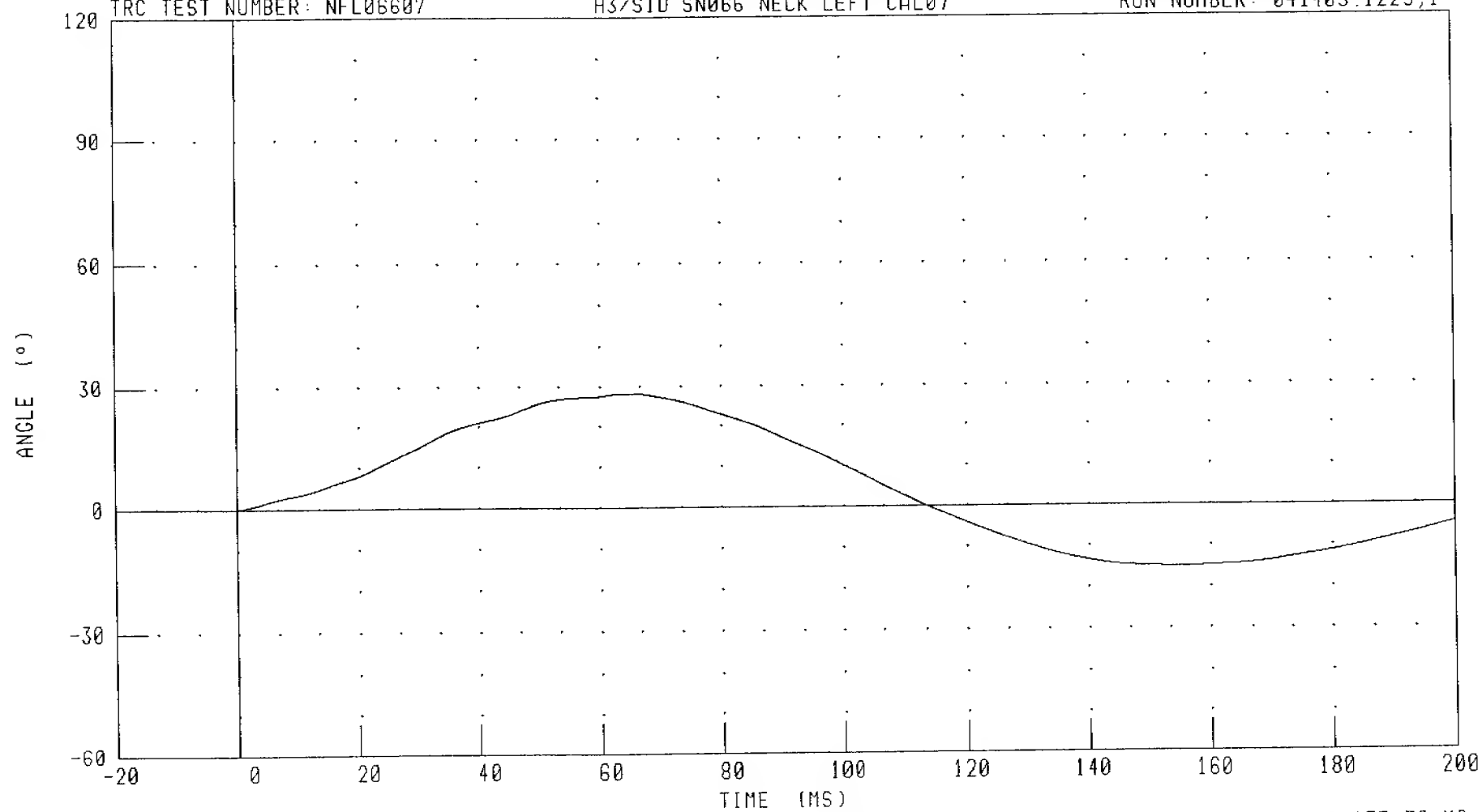
H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

ROTATION ABOUT BASE OF NECK

TRC TEST NUMBER: NFL06607

H3/SID SN066 NECK LEFT CAL07

RUN NUMBER: 041403.1229;1



CHANNEL: BETA

FILTER: CH. CLASS 60

PEAK DATA: 28.23 ° @ 64.72 MS; -15.00 ° @ 155.76 MS

030422-1

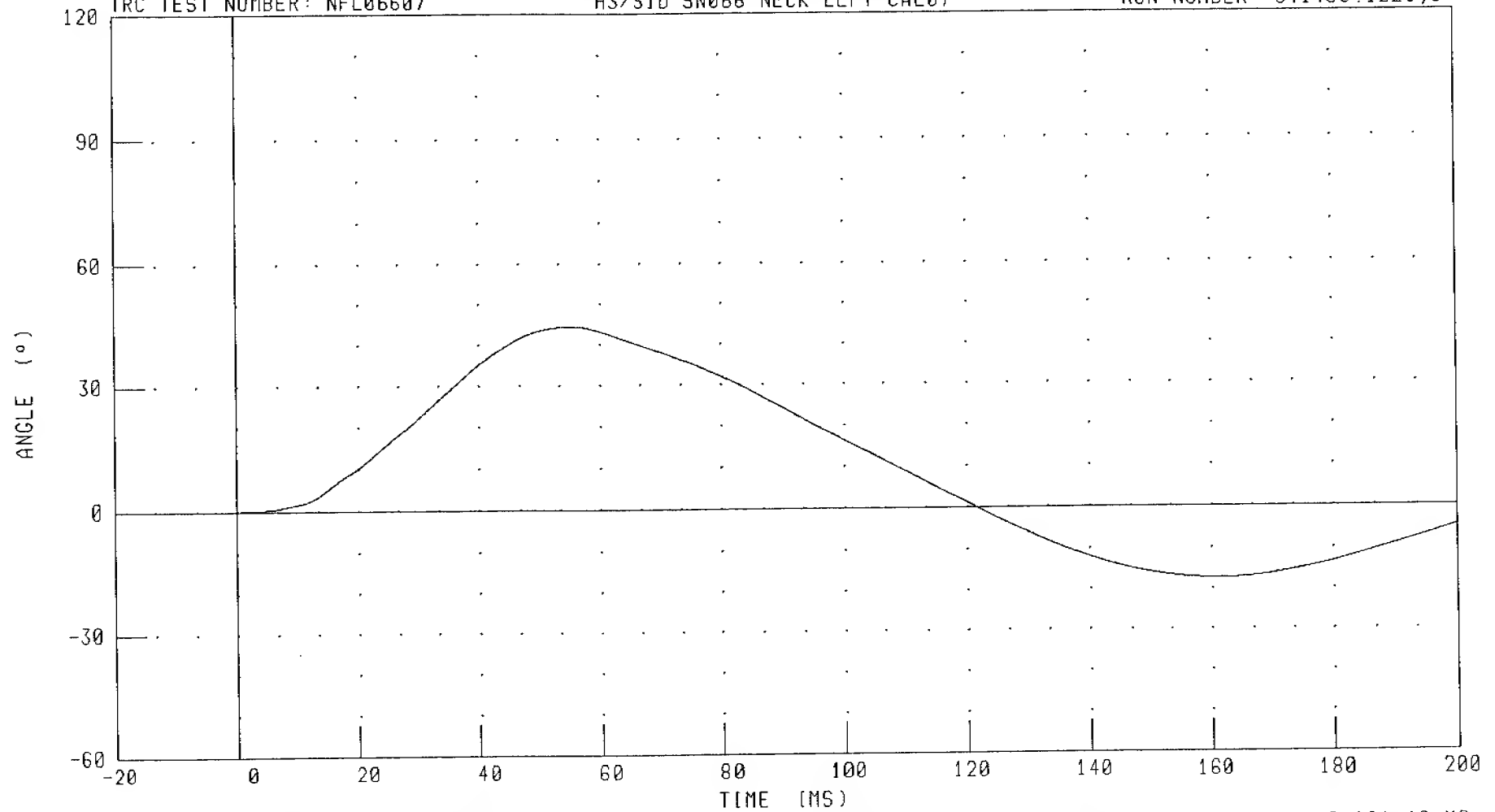
H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

ROTATION ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: NFL06607

H3/SID SN066 NECK LEFT CAL07

RUN NUMBER: 041403.1229;1



CHANNEL: THETA

FILTER: CH. CLASS 60

PEAK DATA: 44.46 ° @ 55.52 MS; -17.33 ° @ 161.12 MS

030422-1

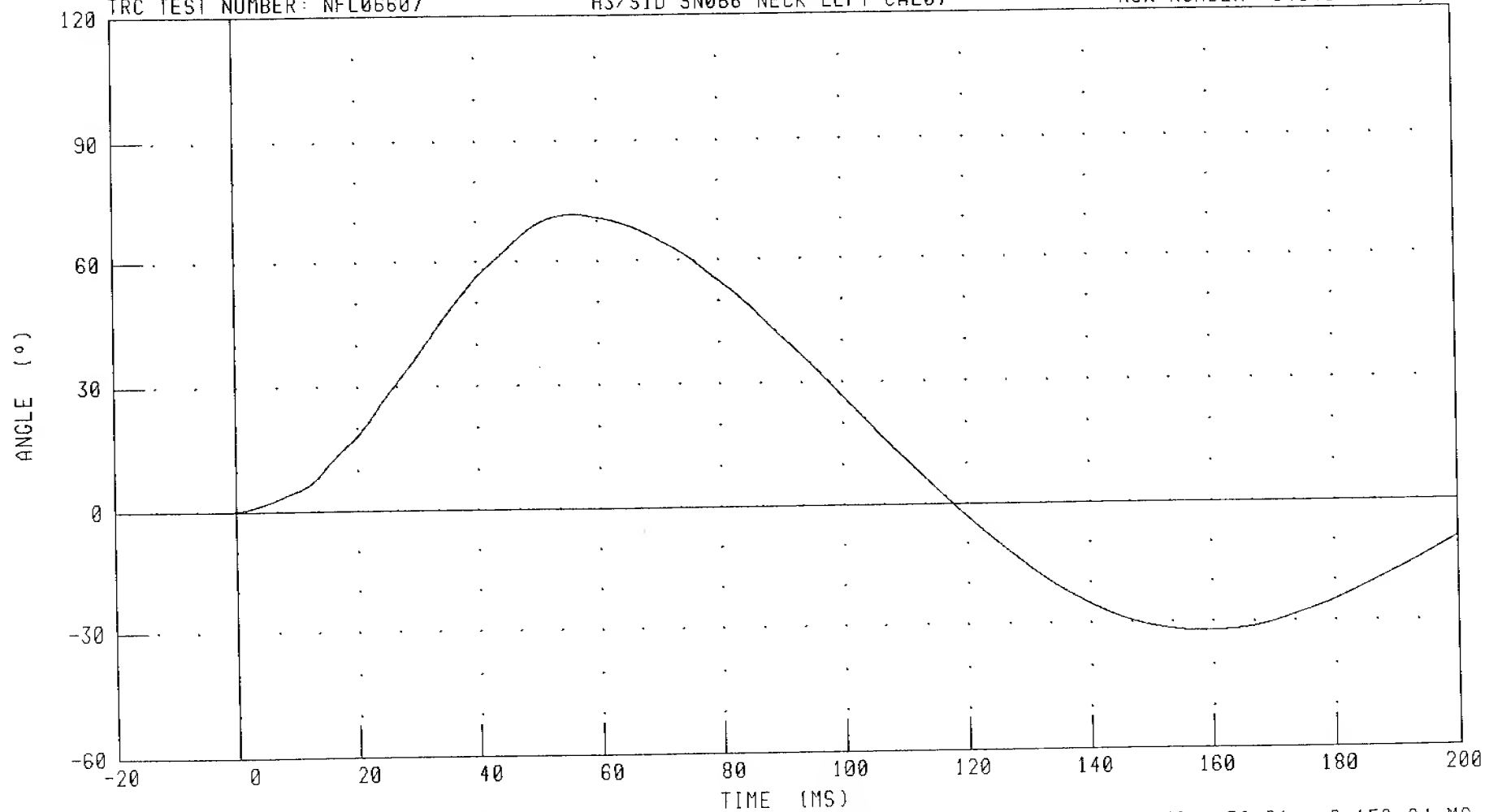
H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

TOTAL ROTATION

TRC TEST NUMBER: NFL06607

H3/SID SN066 NECK LEFT CAL07

RUN NUMBER: 041403.1229;1



CHANNEL: TOTAN

FILTER: CH. CLASS 60

PEAK DATA: 71.63 ° @ 56.16 MS; -32.21 ° @ 159.04 MS

030422-1

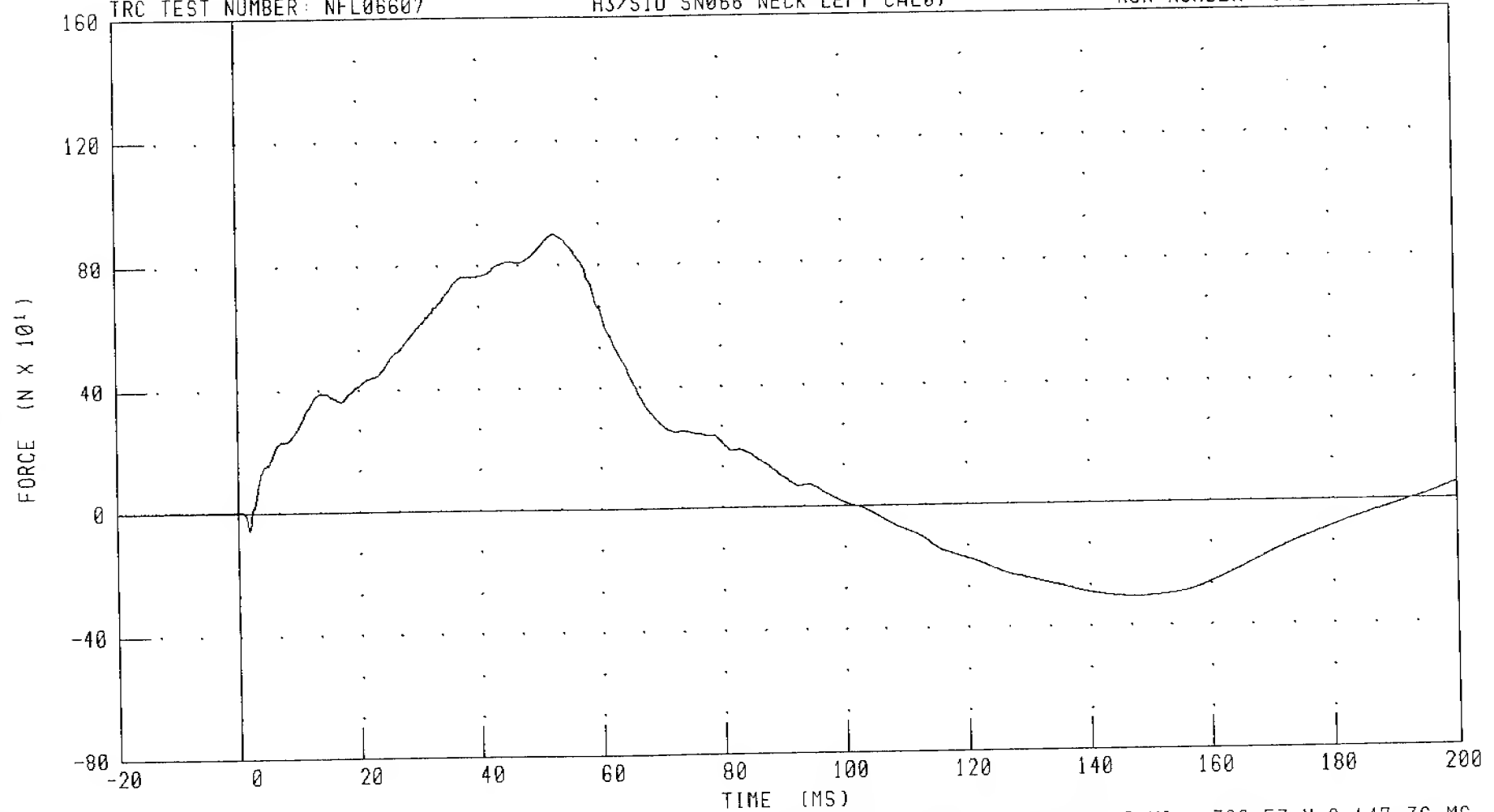
H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

NECK FORCE Y AXIS

TRC TEST NUMBER: NFL06607

H3/SID SN066 NECK LEFT CAL07

RUN NUMBER: 041403.1229;1



CHANNEL: NEKYF

FILTER: CH. CLASS 1000

PEAK DATA: 899.83 N @ 52.48 MS; -306.53 N @ 147.36 MS

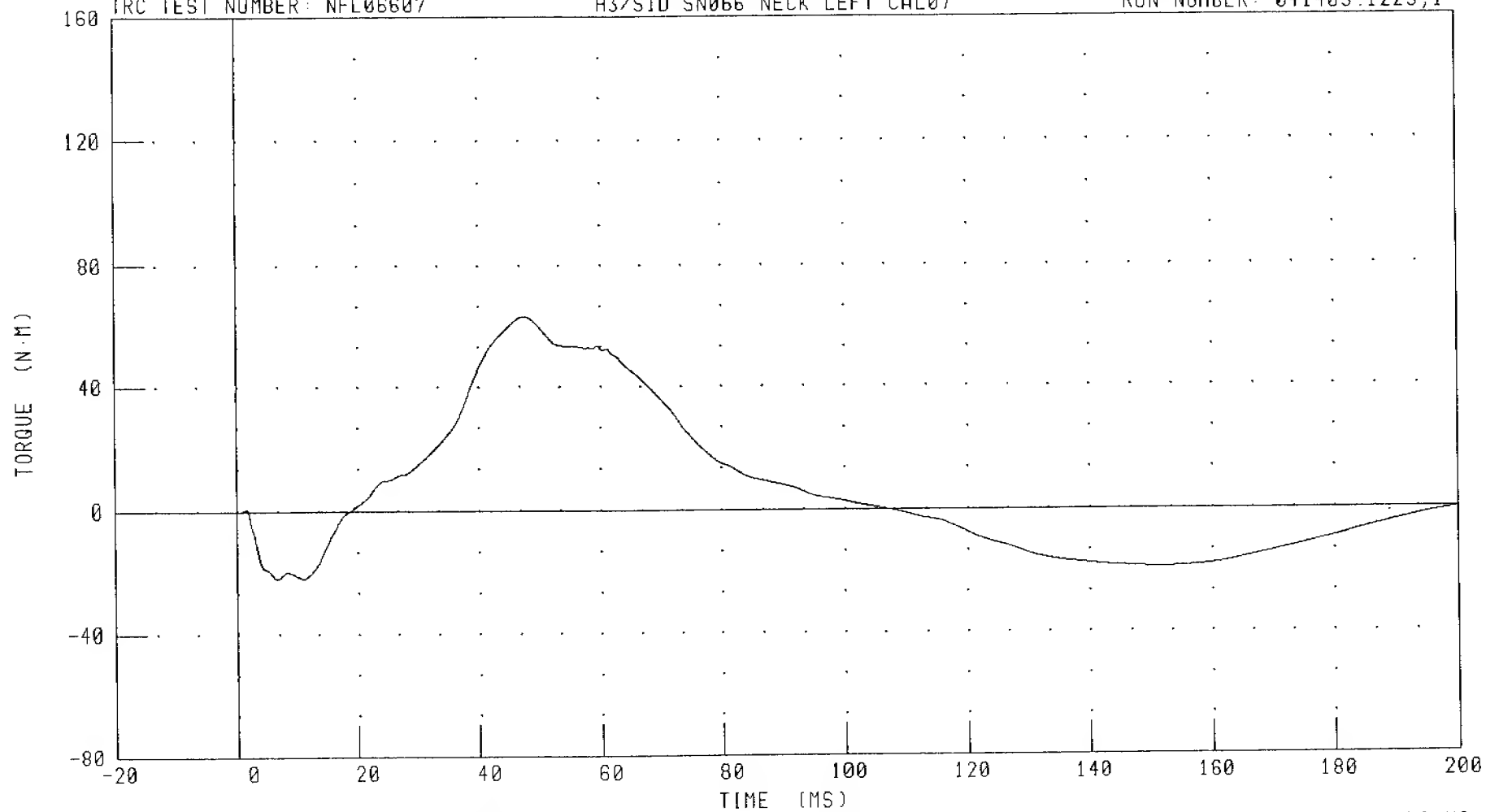
030422-1

H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST
NECK MOMENT X AXIS

TRC TEST NUMBER: NFL06607

H3/SID SN066 NECK LEFT CAL07

RUN NUMBER: 041403.1229;1



CHANNEL: NEKXM

FILTER: CH CLASS 600

PEAK DATA: 63.36 N·m @ 47.52 ms; -21.97 N·m @ 6.56 ms

C-51

030422-1

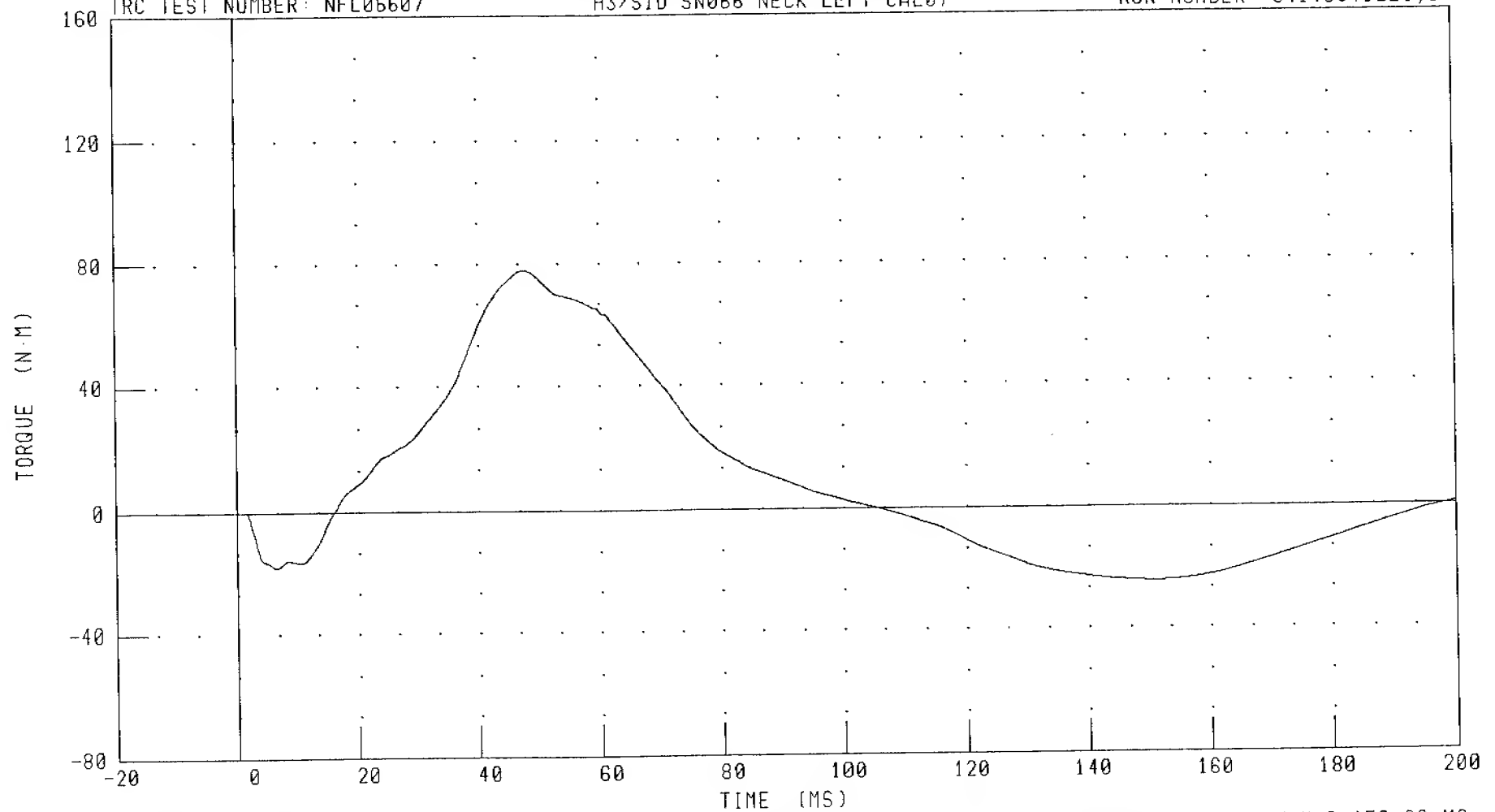
H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

TOTAL MOMENT ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: NFL06607

H3/SID SN066 NECK LEFT CAL07

RUN NUMBER: 041403.1229;1



CHANNEL: NEKOM

FILTER: CH. CLASS 600

PEAK DATA: 77.82 N-M @ 47.76 MS; -24.41 N-M @ 150.88 MS

C-52

030422-1

TRANSPORTATION RESEARCH CENTER INC.

LATERAL THORAX IMPACT TEST

SIDE IMPACT DUMMY

14-APR-03

LEFT SIDE CONFIGURATION

TRC INC.

TEST NO: STL06607

572F SID SN066 L.THORAX CAL07

TEST PARAMETER	SPECIFICATION (ABSOLUTE VALUE)	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	38.0 %
PENDULUM VELOCITY	4.21 - 4.33 M/S	4.26 M/S
PEAK ACCELERATION: UPPER RIB BAR	37 - 46 G	39.9 G
PEAK ACCELERATION: LOWER RIB BAR	37 - 46 G	40.6 G
PEAK ACCELERATION: LOWER THORACIC SPINE	15 - 22 G	18.7 G

TEST MEETS SPECIFICATIONS

TECHNICIAN 

RUN NUMBER: 041403.0757;1

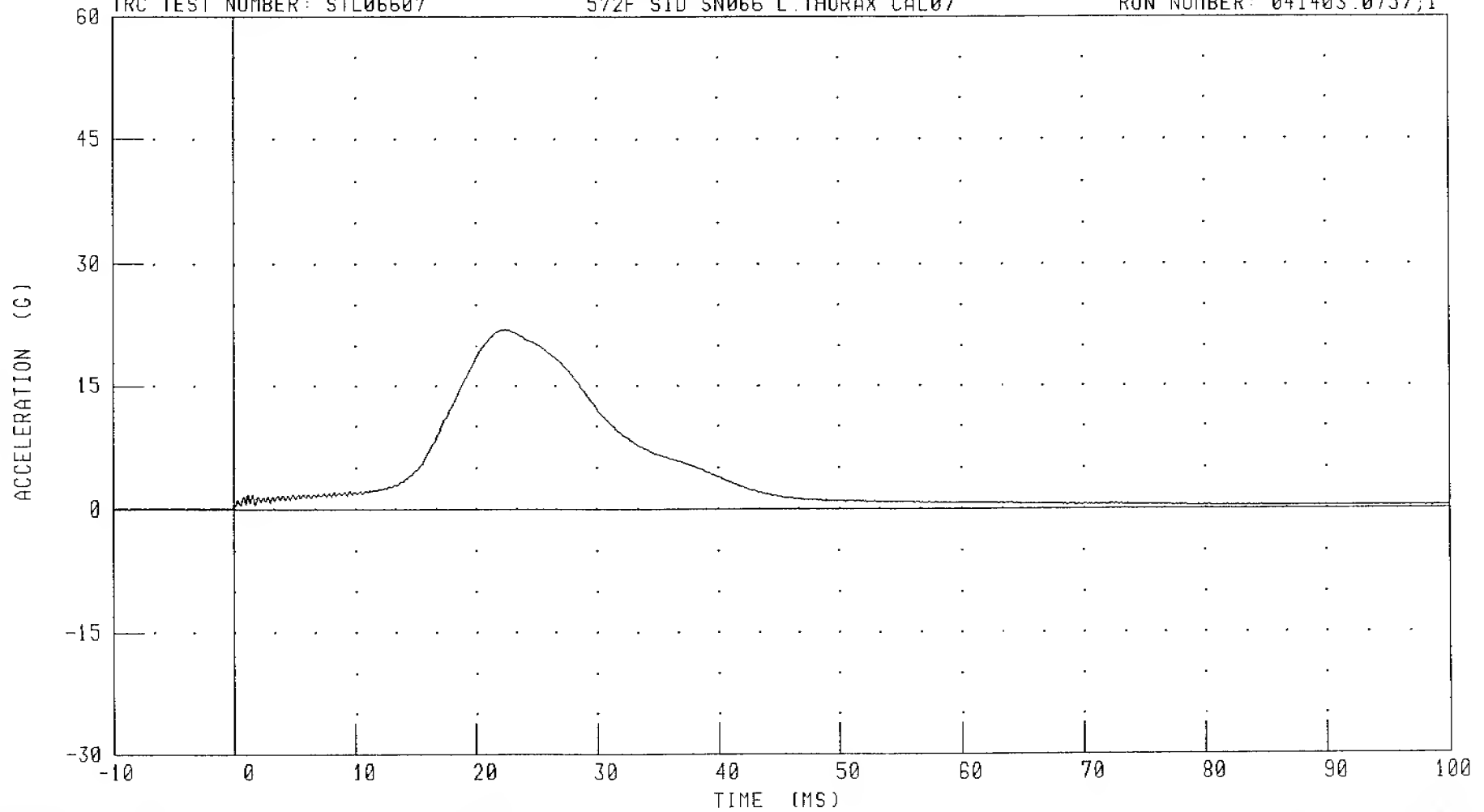
PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)

PENDULUM DECELERATION

TRC TEST NUMBER: STL06607

572F SID SN066 L THORAX CAL07

RUN NUMBER: 041403.0757;1



CHANNEL: PENXC

FILTER: CH. CLASS 1000

PEAK DATA: 22.00 G @ 22.48 MS; 0.02 G @ -9.92 MS

030422-1

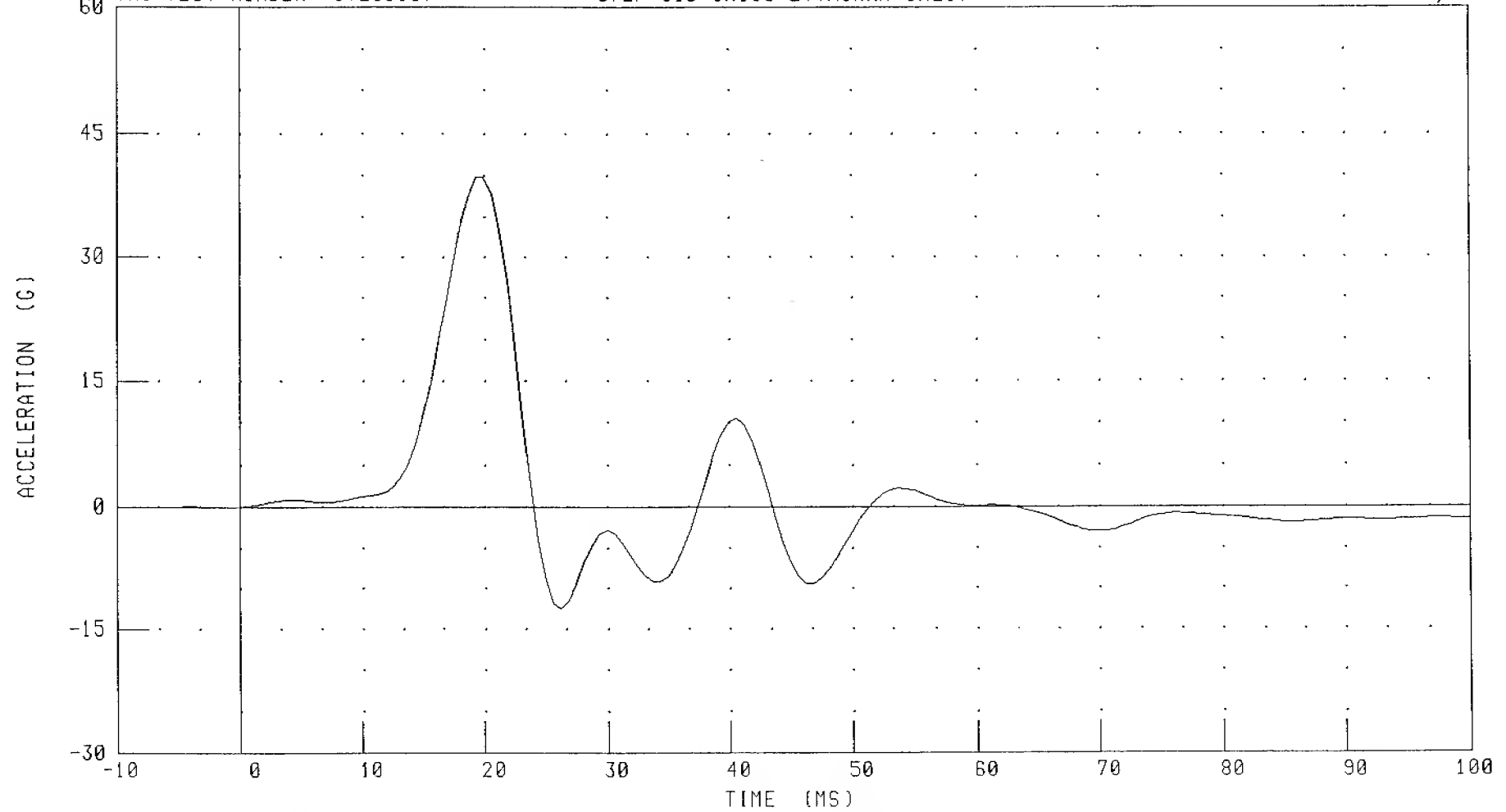
PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)

LEFT UPPER RIB ACCELERATION Y AXIS

TRC TEST NUMBER: STL06607

572F SID SN066 L THORAX CAL07

RUN NUMBER: 041403.0757;1



CHANNEL: LURYG

FILTER: FIR 100

PEAK DATA: 39.89 G @ 20.00 MS; -12.52 G @ 26.25 MS

030422-1

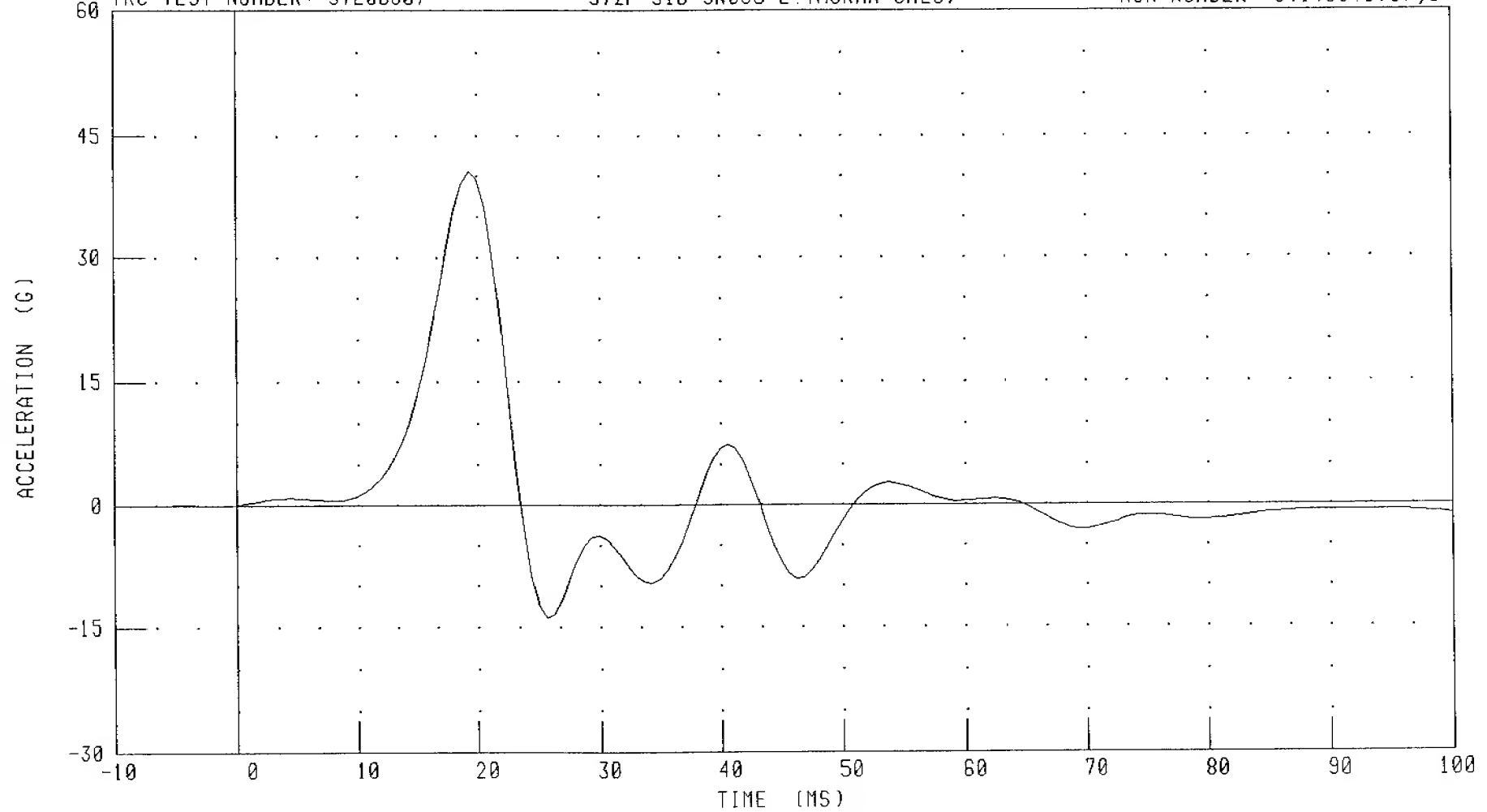
PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)

LEFT LOWER RIB ACCELERATION Y AXIS

TRC TEST NUMBER: STL06607

572F SID SN066 L THORAX CAL07

RUN NUMBER: 041403.0757;1



CHANNEL: LLRYG

FILTER: FIR 100

030422-1

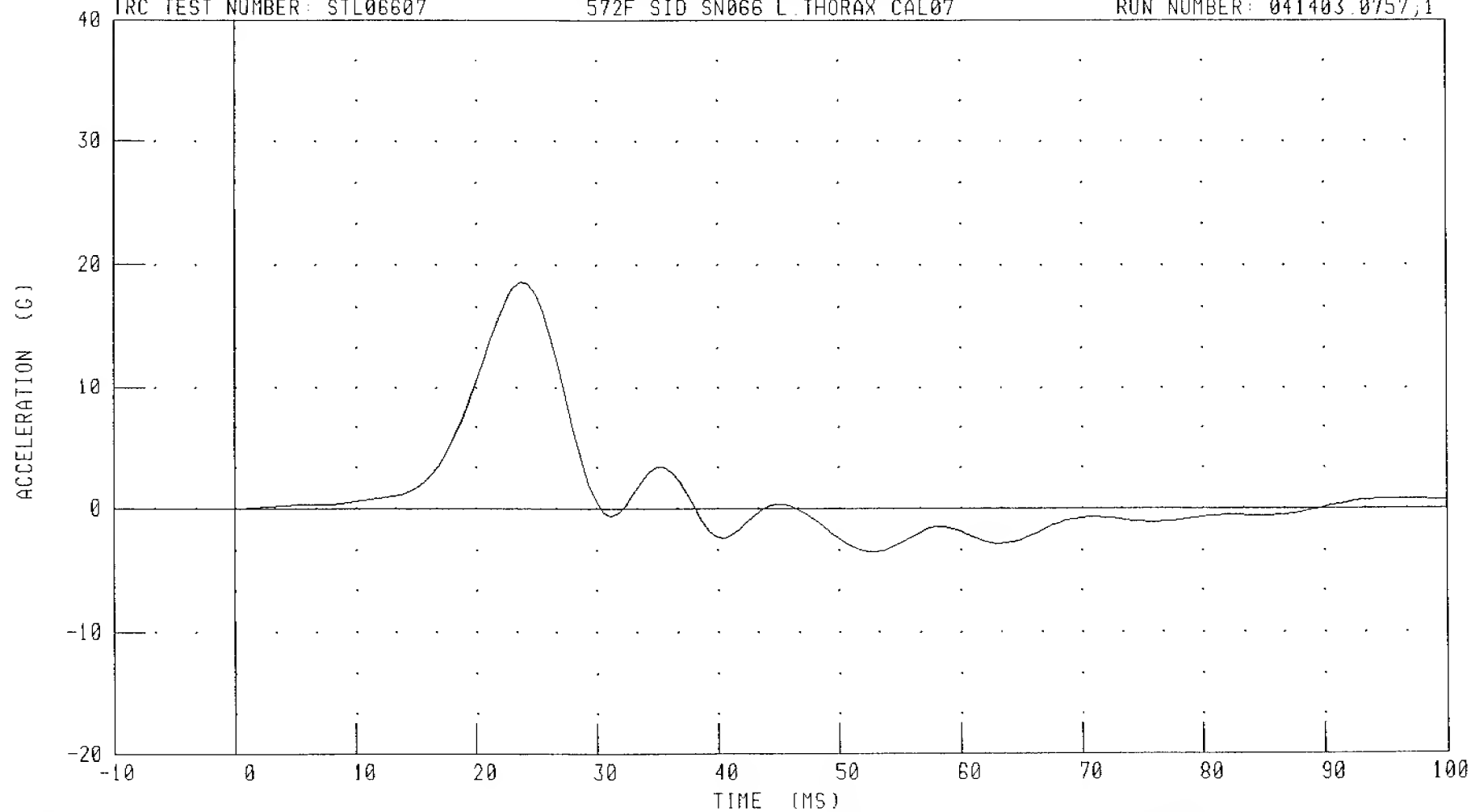
PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)

LOWER SPINE ACCELERATION Y AXIS

TRC TEST NUMBER: STL06607

572F SID SN066 L THORAX CAL07

RUN NUMBER: 041403.0757;1



CHANNEL T12YC

FILTER: FIR 100

PEAK DATA: 18.70 G @ 23.75 MS; -3.53 G @ 53.12 MS

030422-1

TRANSPORTATION RESEARCH CENTER INC.

THORACIC SHOCK ABSORBER TESTS

SIDE IMPACT DUMMY

03-FEB-03

TRC INC.

572F SN066 DAMPER TEST CAL02

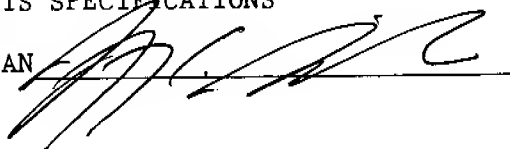
TEST NUMBERS: DP06602A,DP06602B,DP06602C

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		18.9 - 25.5 C	21.7 DEG. C
RELATIVE HUMIDITY		10 - 70 %	46.0 %
VELOCITY	FORCE	667 - 925 N	797 N
2.70 M/S	DISPLACEMENT	29.7 - 34.5 MM	29.9 MM
VELOCITY	FORCE	1733 - 2100 N	1877 N
4.26 M/S	DISPLACEMENT	31.6 - 37.2 MM	35.9 MM
VELOCITY	FORCE	3703 - 4402 N	4387 N
6.07 M/S	DISPLACEMENT	33.3 - 39.5 MM	37.8 MM

DAMPER SETTING = 5.0

TEST MEETS SPECIFICATIONS

TECHNICIAN



RUN NUMBER: 020303.0731;1

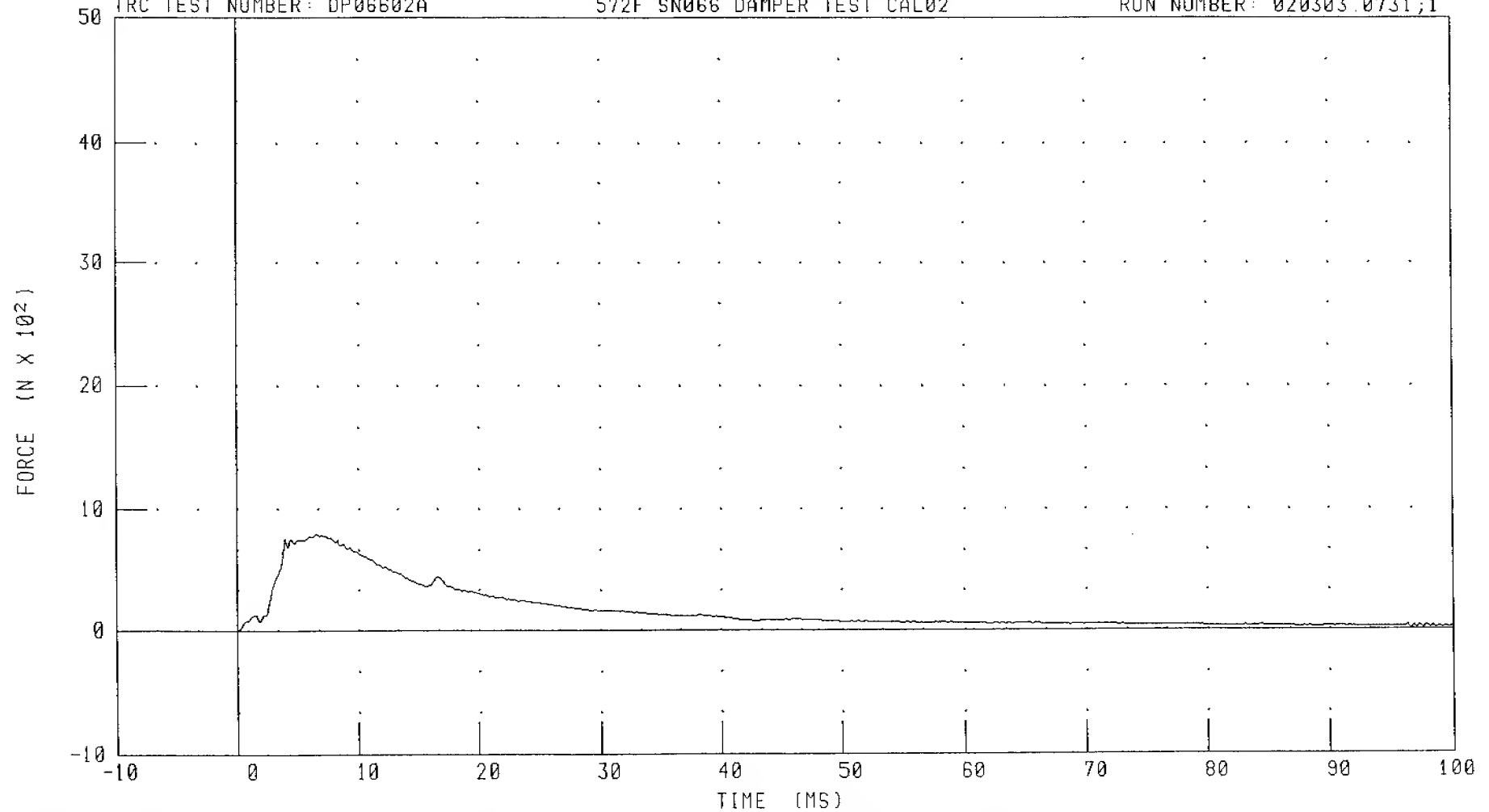
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (3.0 M/SEC)

SHOCK ABSORBER RESISTIVE FORCE

TRC TEST NUMBER: DP06602A

572F SN066 DAMPER TEST CAL02

RUN NUMBER: 020303.0731;1



CHANNEL: DAMPF FILTER: CH. CLASS 1000

PEAK DATA: 796.77 N @ 6.48 MS; -2.09 N @ -10.00 MS

030422-1

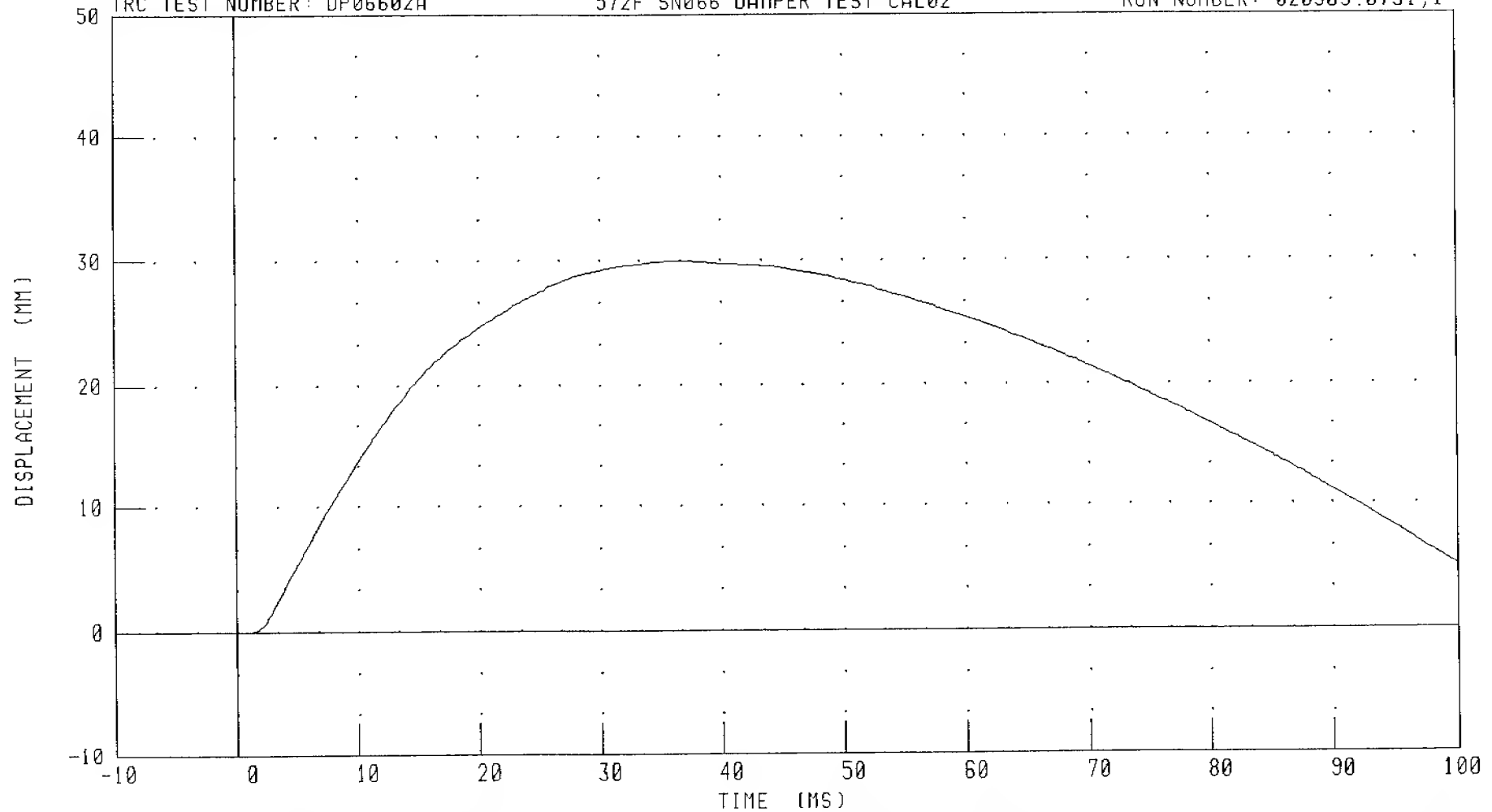
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (3.0 M/SEC)

SHOCK ABSORBER DISPLACEMENT

TRC TEST NUMBER: DP06602A

572F SN066 DAMPER TEST CAL02

RUN NUMBER: 020303.0731;1



CHANNEL: CSTYD

FILTER: CH. CLASS 1000

PEAK DATA: 29.94 MM @ 36.24 MS; 0.00 MM @ -4.40 MS

030422-1

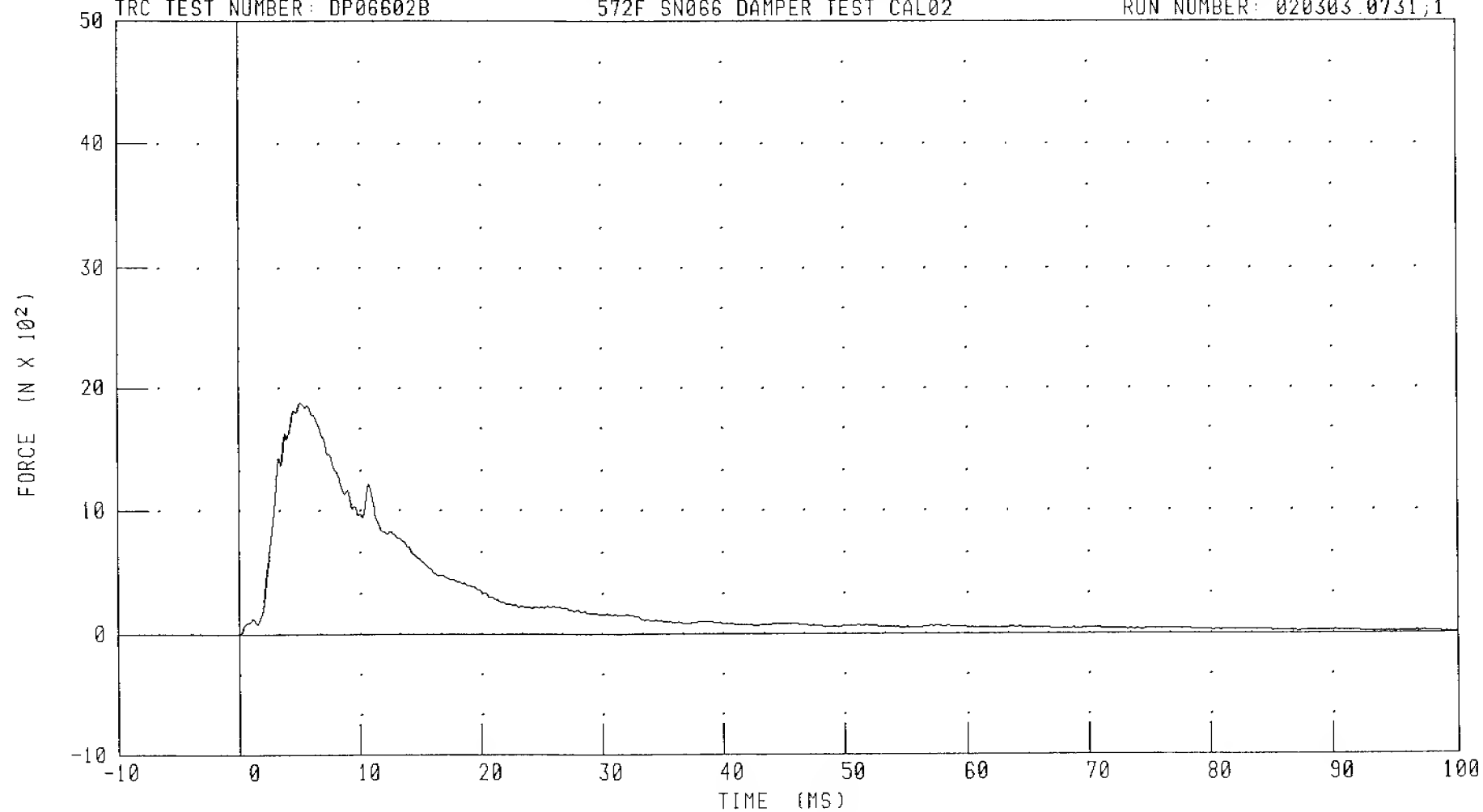
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (4.3 M/SEC)

SHOCK ABSORBER RESISTIVE FORCE

TRC TEST NUMBER: DP06602B

572F SN066 DAMPER TEST CAL02

RUN NUMBER: 020303.0731;1



CHANNEL: DAMPF

FILTER: CH. CLASS 1000

PEAK DATA: 1876.76 N @ 5.12 MS; -2.32 N @ -8.96 MS

030422-1

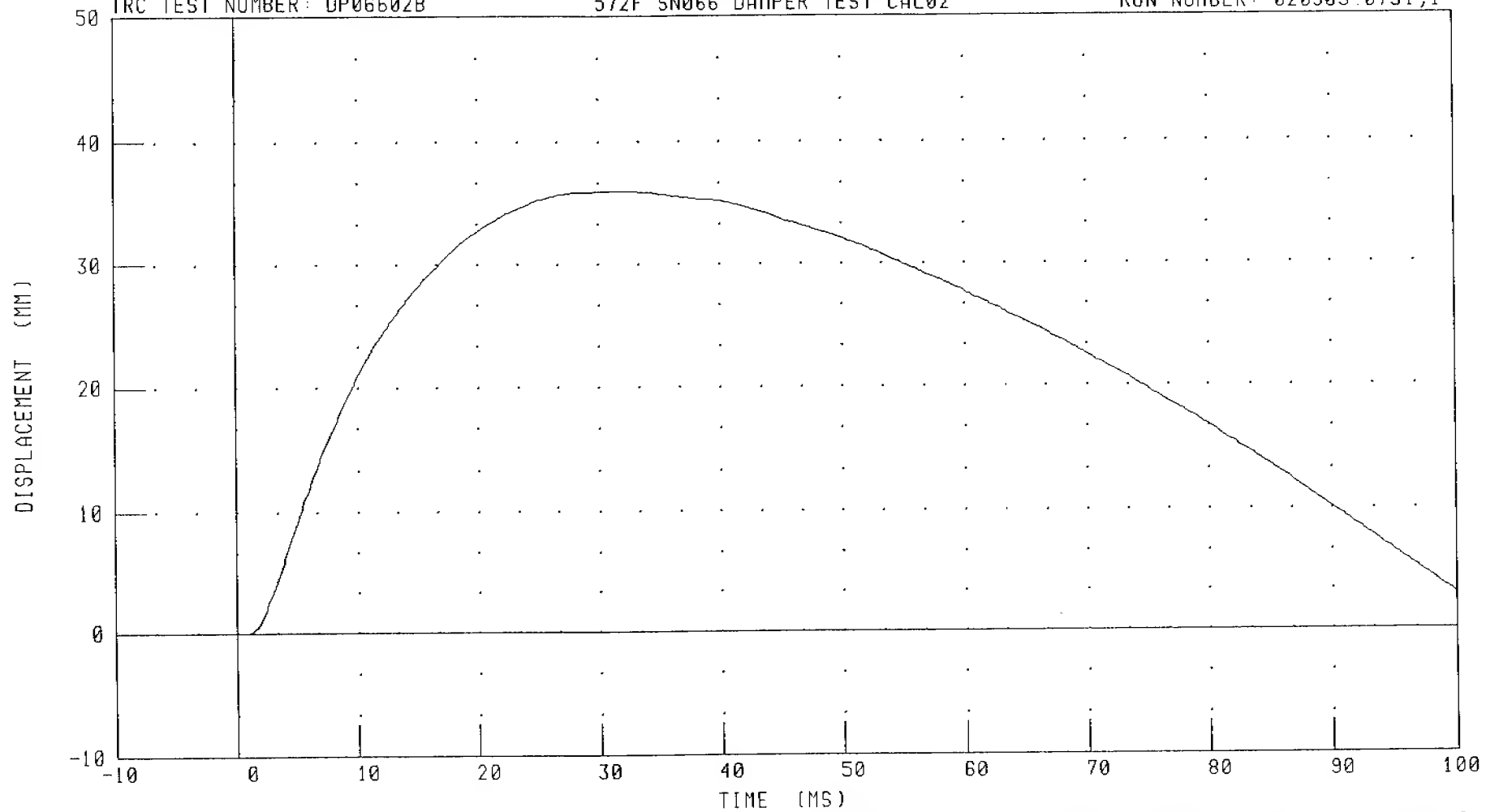
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (4.3 M/SEC)

SHOCK ABSORBER DISPLACEMENT

TRC TEST NUMBER: DP06602B

572F SN066 DAMPER TEST CAL02

RUN NUMBER: 020303.0731;1



CHANNEL: CSTYD

FILTER: CH. CLASS 1000

PEAK DATA: 35.94 MM @ 31.12 MS; 0.00 MM @ -7.68 MS

030422-1

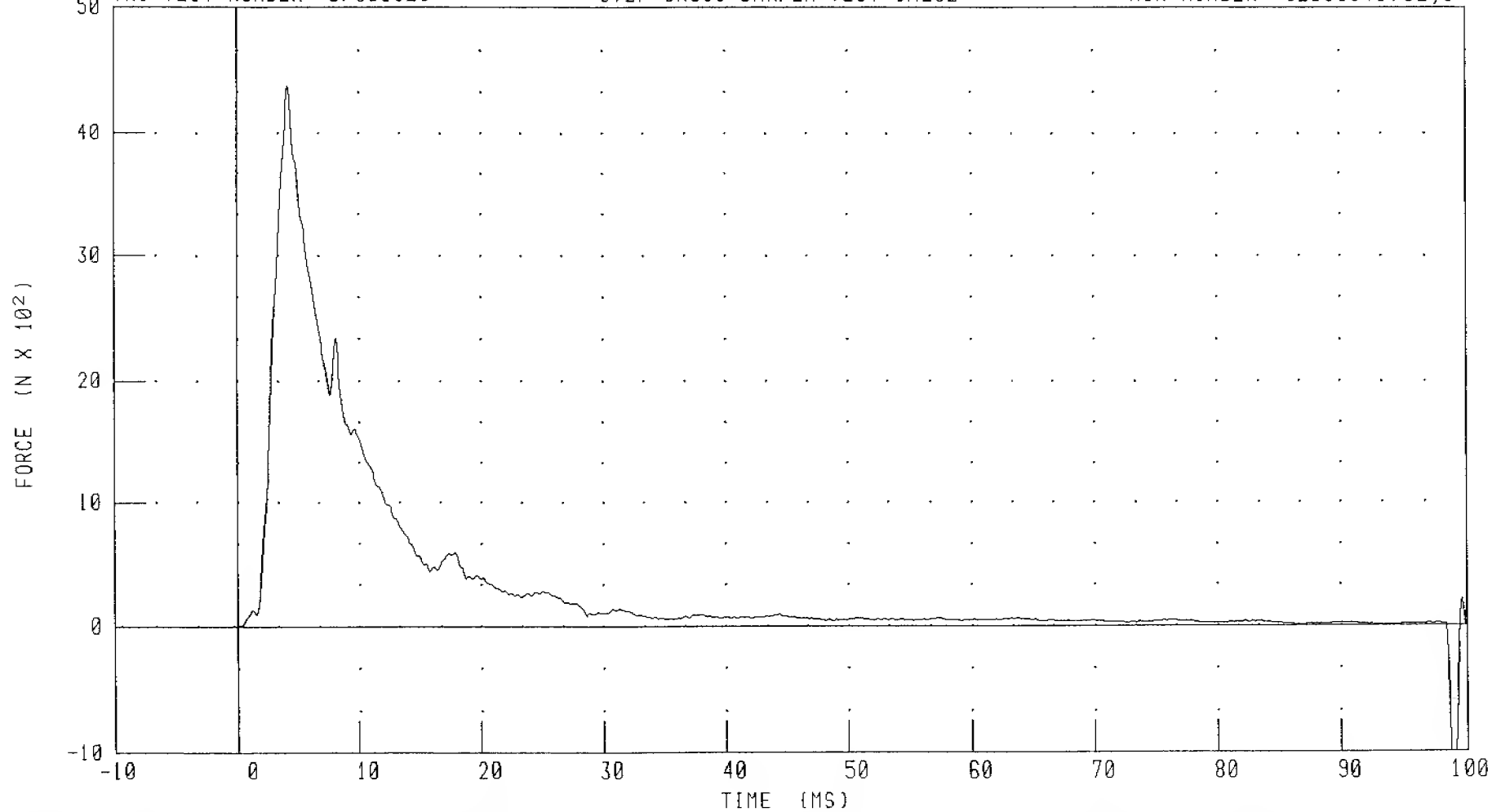
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (6.1 M/SEC)

SHOCK ABSORBER RESISTIVE FORCE

TRC TEST NUMBER: DP06602C

572F SN066 DAMPER TEST CAL02

RUN NUMBER: 020303.0732;1



CHANNEL: DAMPF FILTER: CH. CLASS 1000

PEAK DATA: 4387.36 N @ 4.16 MS; -1635.86 N @ 98.88 MS

030422-1

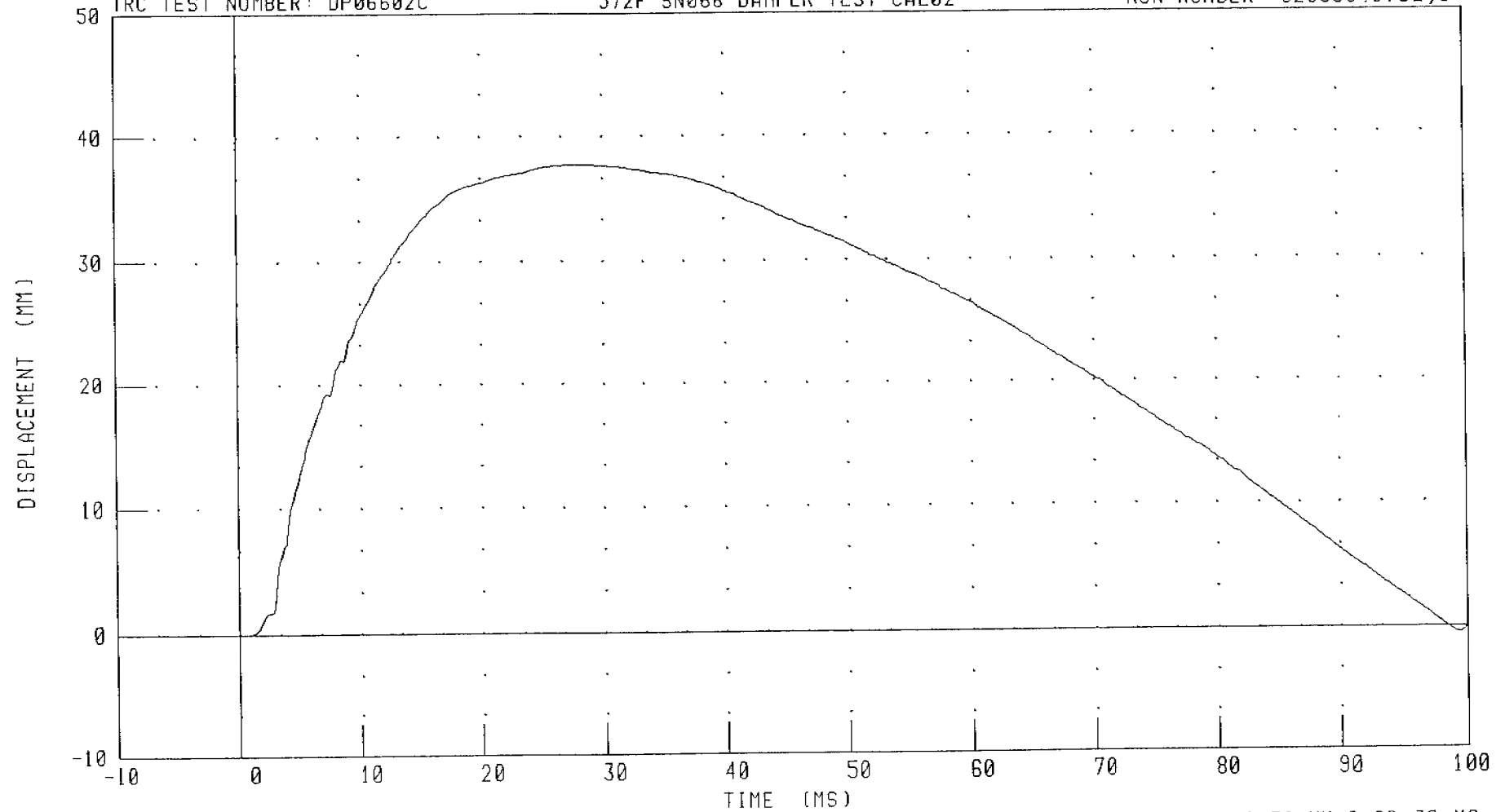
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (6.1 M/SEC)

SHOCK ABSORBER DISPLACEMENT

TRC TEST NUMBER: DP06602C

572F SN066 DAMPER TEST CAL02

RUN NUMBER: 020303.0732;1



CHANNEL: CSTYD

FILTER: CH. CLASS 1000

PEAK DATA: 37.76 MM @ 27.76 MS; -0.52 MM @ 99.36 MS

C-64

030422-1

TRANSPORTATION RESEARCH CENTER INC.

LUMBAR FLEXION TEST

SID PART 572B

CAL DATE: 14-Apr-03

TRC, INC.

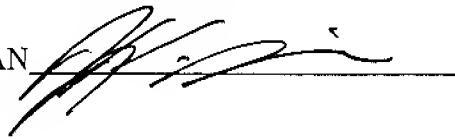
TEST NO: 066C07TF1

572B SN 066 TORSO FLEX CAL 07

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 – 25.6° C	21.7 °C
RELATIVE HUMIDITY	10 – 70 %	49 %
FORCE AT 0 DEG. FLEXION	-27 – 27 N	0 N
FORCE AT 20 DEG OF FLEXION	98 – 151 N	115.7 N
FORCE AT 30 DEG OF FLEXION	151 – 205 N	169.0 N
FORCE AT 40 DEG OF FLEXION	205 – 258 N	231.3 N
NET RETURN ANGLE AFTER 3 MINUTES	< 12 °	6 °

TEST MEETS SPECIFICATIONS

TECHNICIAN



Transportation Research Center Inc.

572B Abdomen Compression Test

HIII SID Serial No. 066 Calibration No. 07 - 1

Test Date 04/14/2003

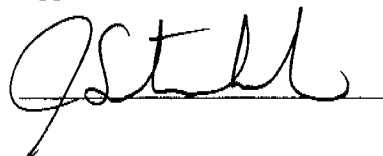
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Displacement Rate	6.35 - 8.89 mm/s	7.1 - 8.9 mm/s	Yes
Data Within Required Corridor	Yes	Yes	Yes

Comments:

Technician



Approved



04.14.2003 09:18:50 11

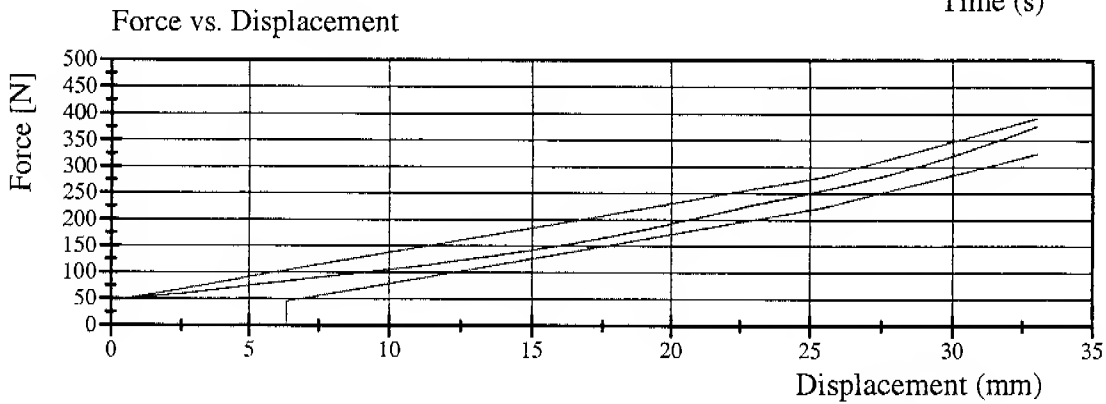
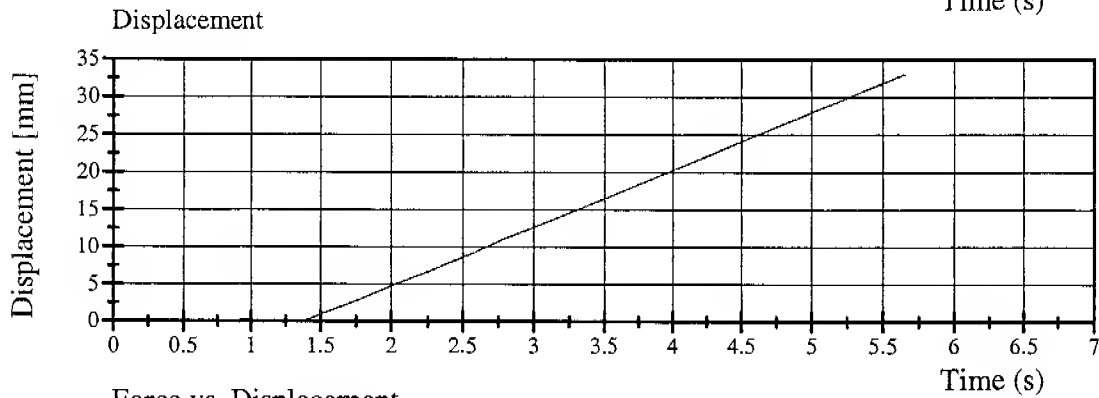
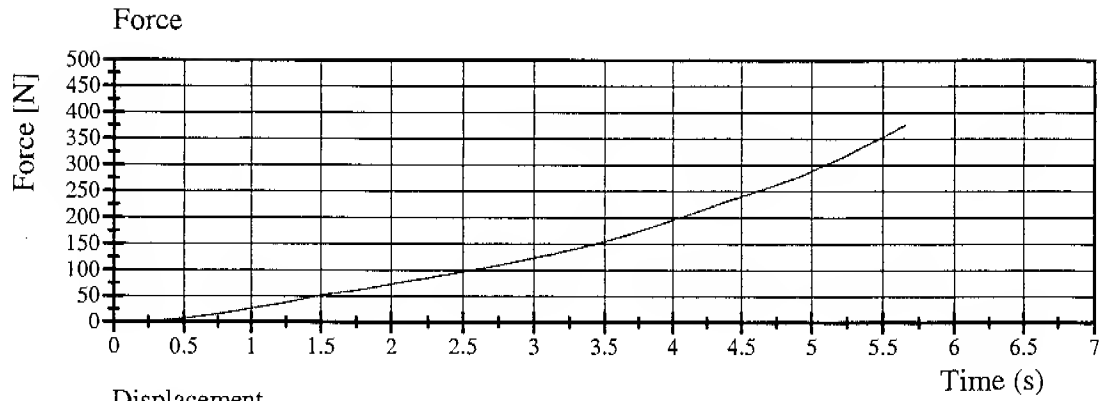


Transportation Research Center Inc.

572B Abdomen Compression Test

HIII SID Serial No. 066 Calibration No. 07 - 1

Test Date 04/14/2003



TRANSPORTATION RESEARCH CENTER INC.

LATERAL PELVIS IMPACT TEST

SIDE IMPACT DUMMY

14-APR-03

LEFT SIDE CONFIGURATION

TRC INC.

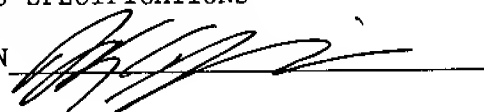
TEST NO: SPL06607

572F SN066 LEFT PELVIS CAL07

TEST PARAMETER	SPECIFICATION (ABSOLUTE VALUE)	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	38.0 %
PENDULUM VELOCITY	4.21 - 4.33 M/S	4.26 M/S
PEAK PELVIC ACCELERATION	40 - 60 G	42.6 G
TIME ABOVE 20 G LEVEL	3 - 7 MS	6.2 MS
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN



RUN NUMBER: 041403.0753;1

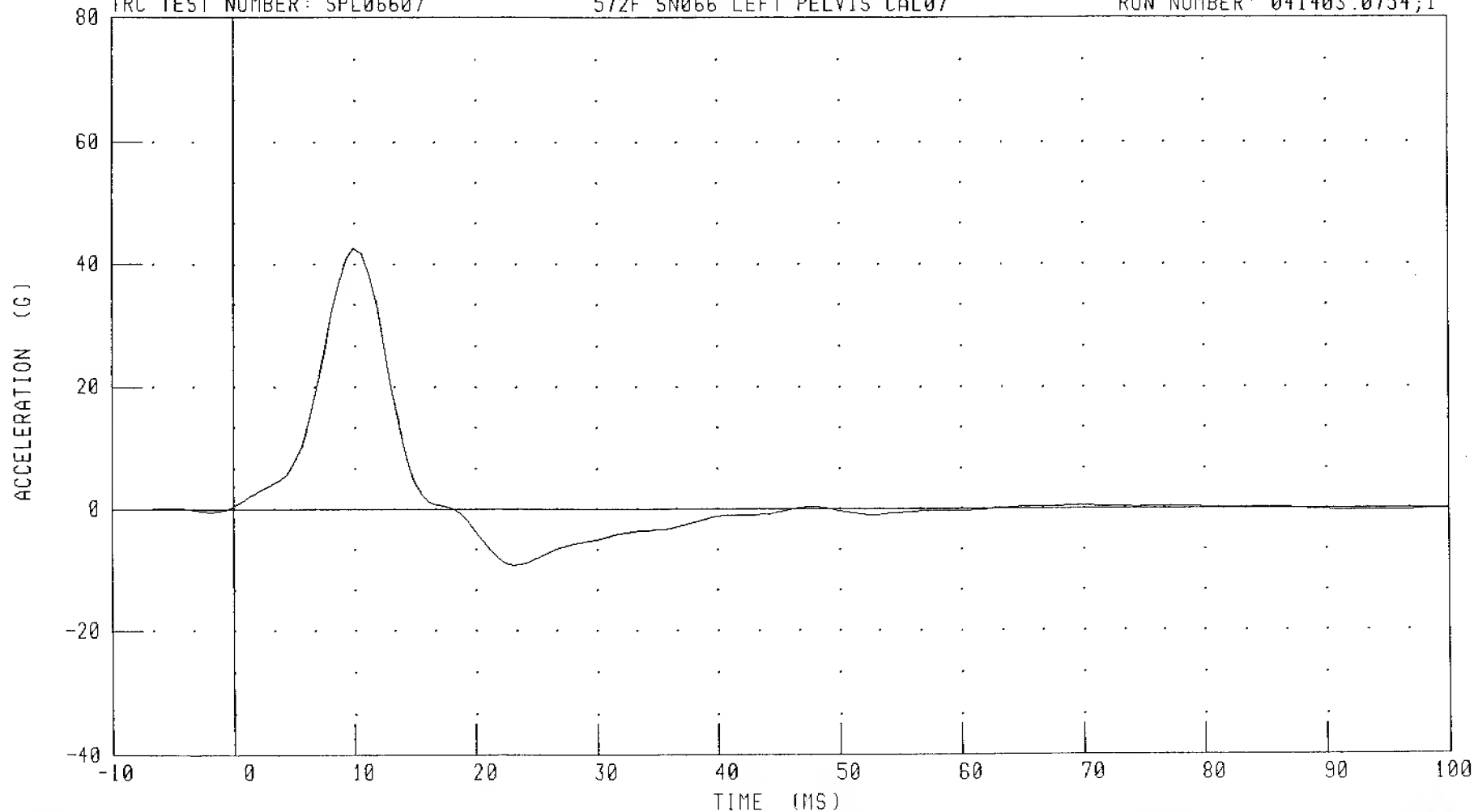
PART 572-F S.I.D. PELVIS CALIBRATION - (LEFT SIDE IMPACT)

PELVIS ACCELERATION Y AXIS

TRC TEST NUMBER: SPL06607

572F SN066 LEFT PELVIS CAL07

RUN NUMBER: 041403.0754;1



CHANNEL: PEVYG

FILTER: FIR 100

PEAK DATA: 42.63 G @ 10.00 MS; -9.33 G @ 23.13 MS

C-69

030422-1

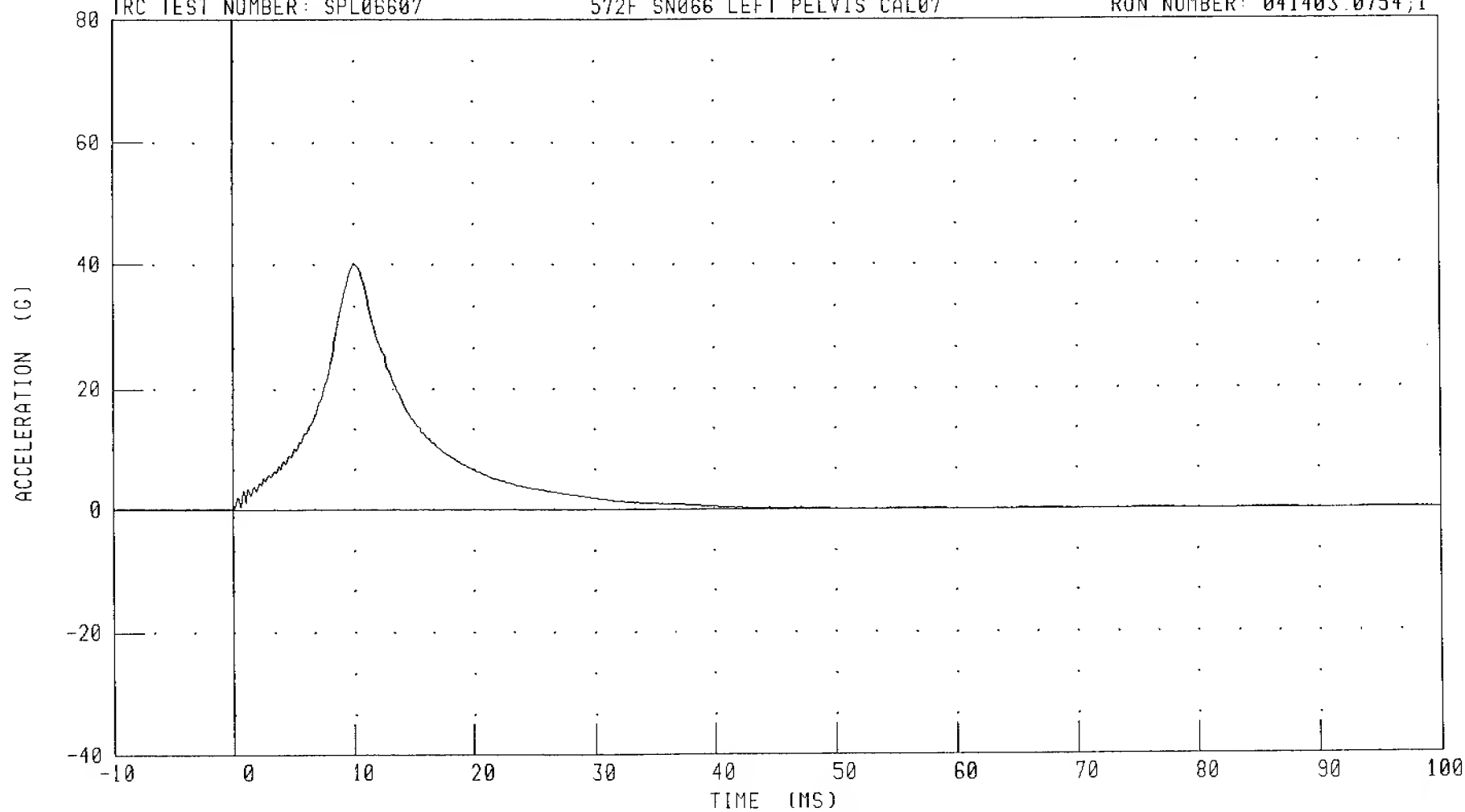
PART 572-F S.I.D. PELVIS CALIBRATION - (LEFT SIDE IMPACT)

PENDULUM DECELERATION

TRC TEST NUMBER: SPL06607

572F SN066 LEFT PELVIS CAL07

RUN NUMBER: 041403.0754;1



CHANNEL: PENXG

FILTER: CH. CLASS 1000

PEAK DATA: 40.19 G @ 10.08 MS; -0.11 G @ 52.32 MS

030422-1

Calibration Test Results

Post-Test

SID-H3: 065

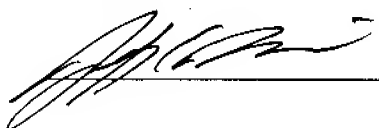
Configured for Left Side Impact

External Dimensions:	The dummy passed all external dimension requirements.
Lateral Head Drop Test:	The head passed all lateral drop test requirements.
Lateral Neck Test:	The neck passed all impact test requirements.
Lateral Thorax Impact Test:	The thorax passed all impact test requirements.
Thoracic Shock Absorber Test:	The thoracic shock absorber was not tested at this time.
Lumbar Flexion Test:	The dummy met the lumbar flexion test requirements.
Abdominal Compression Test:	The abdomen met the compression test requirements.
Pelvis Impact Test:	The lateral pelvis passed all impact test requirements.

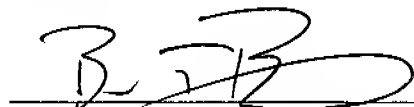
Transportation Research Center Inc.
572M SID/HIII Dummy
External Dimensions
Serial No. 065 Calibration No. 09

Test Parameter	Dimension	Specification	Results	Pass
Seated Height	SH	889.0 - 909.3 mm	896 mm	Yes
Rib Height	RH	501.7 - 520.7 mm	510 mm	Yes
Hip Pivot Height	HP	99.1 REF mm	99.1 mm	
Rib From Backline	RD	228.6 - 241.3 mm	239 mm	Yes
Knee Pivot From Backline	KH	510.5 - 525.8 mm	513 mm	Yes
Knee Pivot From Floor	KV	490.2 - 505.5 mm	500 mm	Yes
Hip Width	HW	355.6 - 391.2 mm	371 mm	Yes
Top Rib Width From C/L	RW-1	165.1 - 180.3 mm	170 mm	Yes
Bottom Rib Width From C/L	RW-2	165.1 - 180.3 mm	171 mm	Yes
Difference Between Top & Bottom Rib Width from C/L		<= 2.5 mm	1.0 mm	Yes

Technician



Approved




TRANSPORTATION RESEARCH CENTER INC.

LATERAL HEAD DROP TEST

SID/HIII DUMMY

25-APR-03

LEFT SIDE CONFIGURATION

TRC INC.

TEST NO. HDL06509

572M SID/HIII SN065 HEAD CAL09

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.6 deg. C	21.11 deg. C
RELATIVE HUMIDITY	10 - 70 %	25.00 %
PEAK RESULTANT ACCELERATION	120 - 150 G	137.25 G
PEAK LONGITUDINAL ACCELERATION	15 G MAX	-10.26 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN 

RUN NUMBER: 042503.1431;1

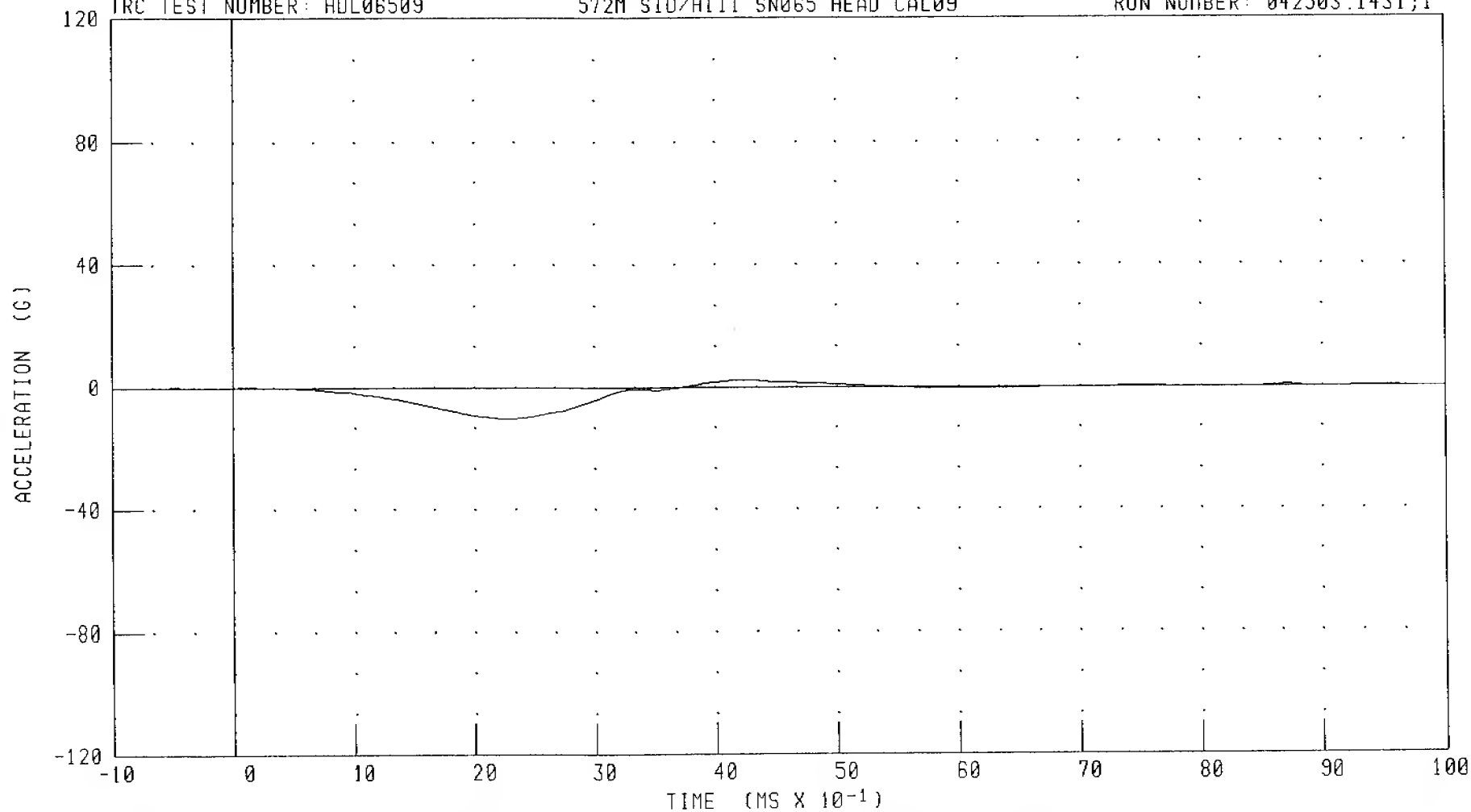
572M SID/HIII DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD ACCELERATION X AXIS

TRC TEST NUMBER: HDL06509

572M SID/HIII SN065 HEAD CAL09

RUN NUMBER: 042503.1431;1



CHANNEL: HEDXC

FILTER: CH. CLASS 1000

PEAK DATA: 2.37 G @ 4.24 MS; -10.26 G @ 2.24 MS

030422-1

572M SID/HIII DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD ACCELERATION Y AXIS

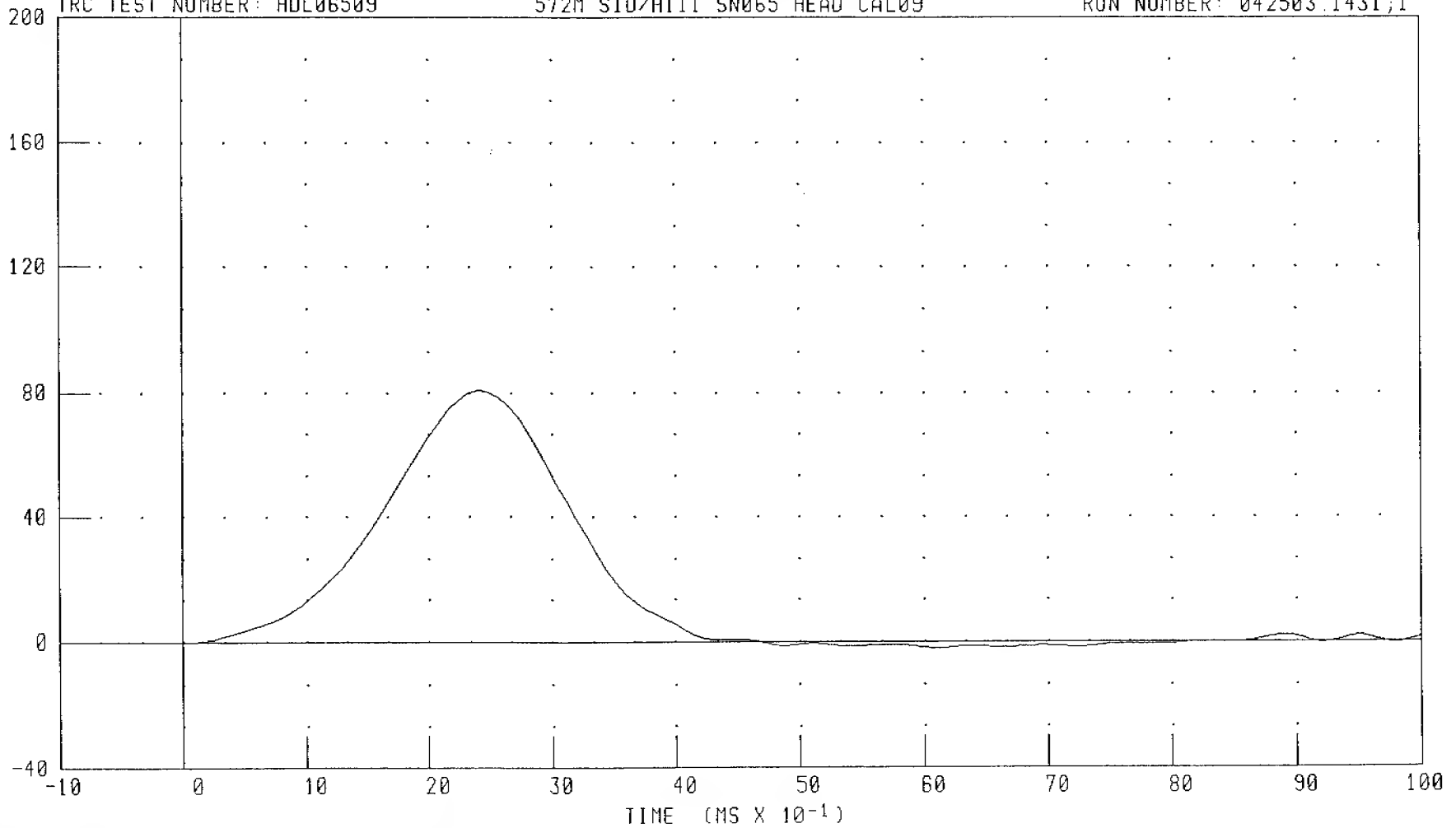
TRC TEST NUMBER: HDL06509

572M SID/HIII SN065 HEAD CAL09

RUN NUMBER: 042503.1431;1

C-75

ACCELERATION (G)



CHANNEL: HEDYG

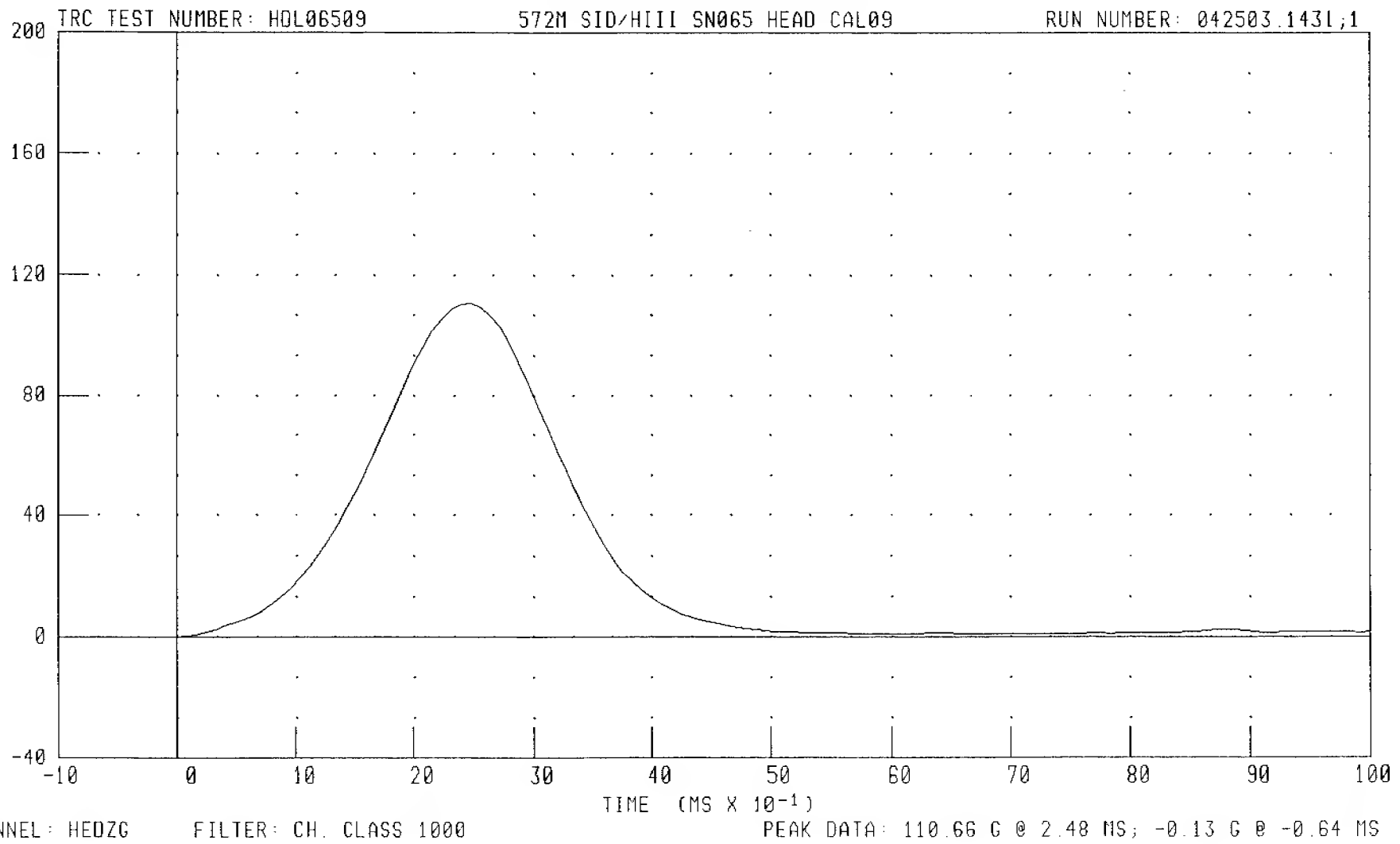
FILTER: CH. CLASS 1000

PEAK DATA: 80.91 G @ 2.40 MS; -2.11 G @ 6.08 MS

030422-1

572M SID/HIII DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD ACCELERATION Z AXIS

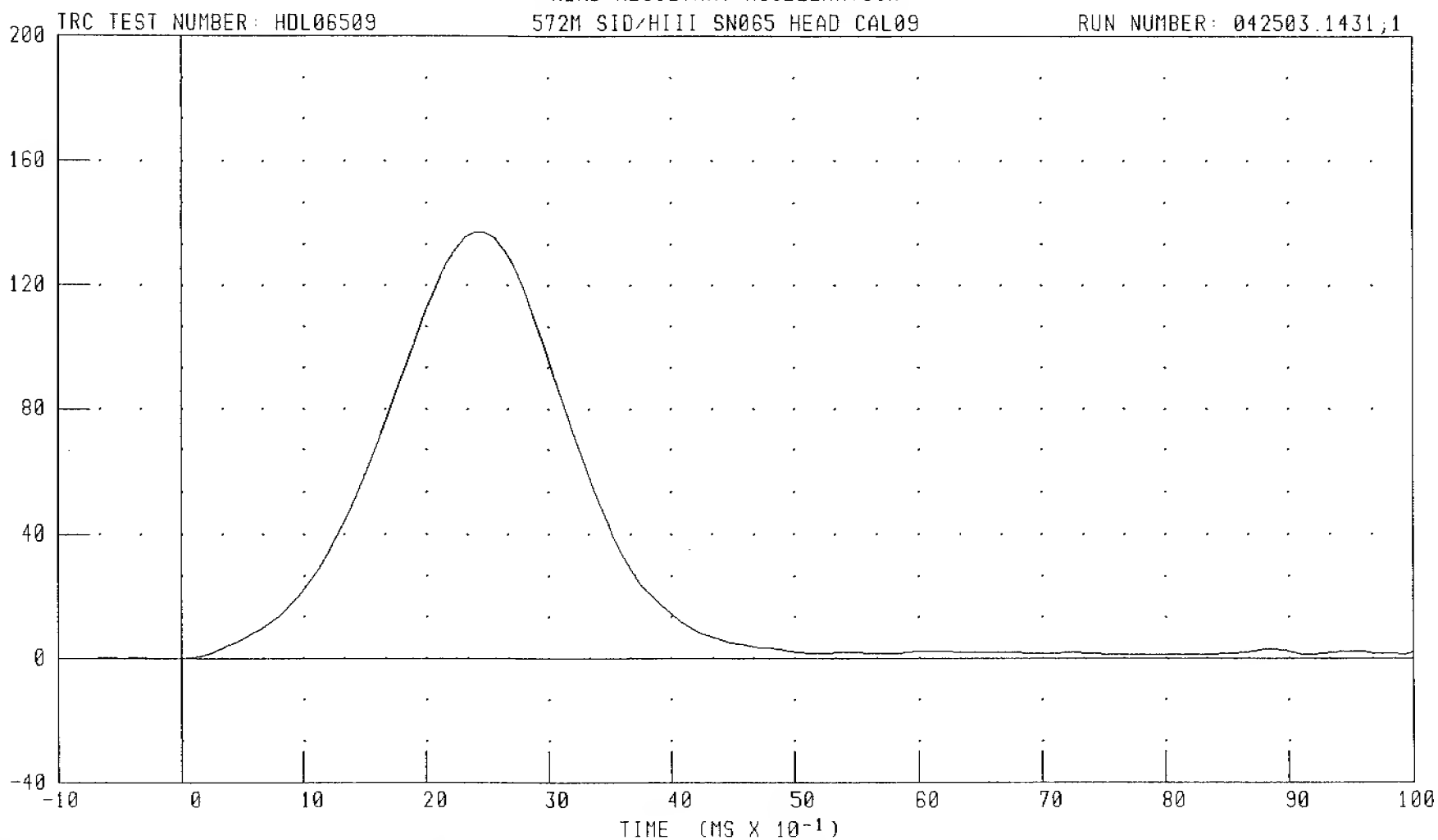


C-76

030422-1

572M SID/HIII DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD RESULTANT ACCELERATION



CHANNEL: HEDRG FILTER: CH. CLASS 1000

PEAK DATA: 137.25 G @ 2.40 MS; 0.03 G @ -0.08 MS

C-77

030422-1

TRANSPORTATION RESEARCH CENTER INC.

LATERAL NECK TEST

SID/HIII DUMMY

25-APR-03

LEFT SIDE CONFIGURATION

TRC INC.

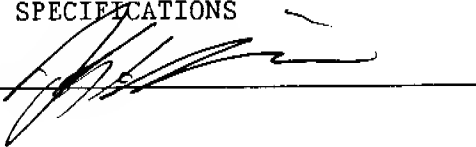
TEST NO. NFL06509

572M SID/HIII SN065 NECK CAL09

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 deg. C	21.11 deg. C
RELATIVE HUMIDITY		10 - 70 %	25.00 %
IMPACT VELOCITY		6.89 - 7.13 M/S	6.99 M/S
INTEGRATED VELOCITY	10 MS	1.96 - 2.55 M/S	2.46 M/S
	20 MS	4.12 - 5.10 M/S	4.84 M/S
	30 MS	5.73 - 7.01 M/S	6.76 M/S
	40 - 70 MS	6.27 - 7.64 M/S	7.08- 7.18 M/S
MAXIMUM MIDSAGGITAL PLANE ROTATION		66 - 82 deg.	69.99 deg.
ROTATION ANGLE DECAY TIME FROM PEAK TO ZERO		58 - 67 MS	60.40 MS
MAXIMUM MOMENT ABOUT OCCIPITAL CONDYLE		73 - 88 NM	81.72 NM
POSITIVE MOMENT DECAY TIME FROM PEAK TO ZERO		49 - 64 MS	51.44 MS
TIME OF MAXIMUM ROTATION AFTER MAXIMUM MOMENT		2 - 16 MS	8.00 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN



RUN NUMBER: 042503.1308;1

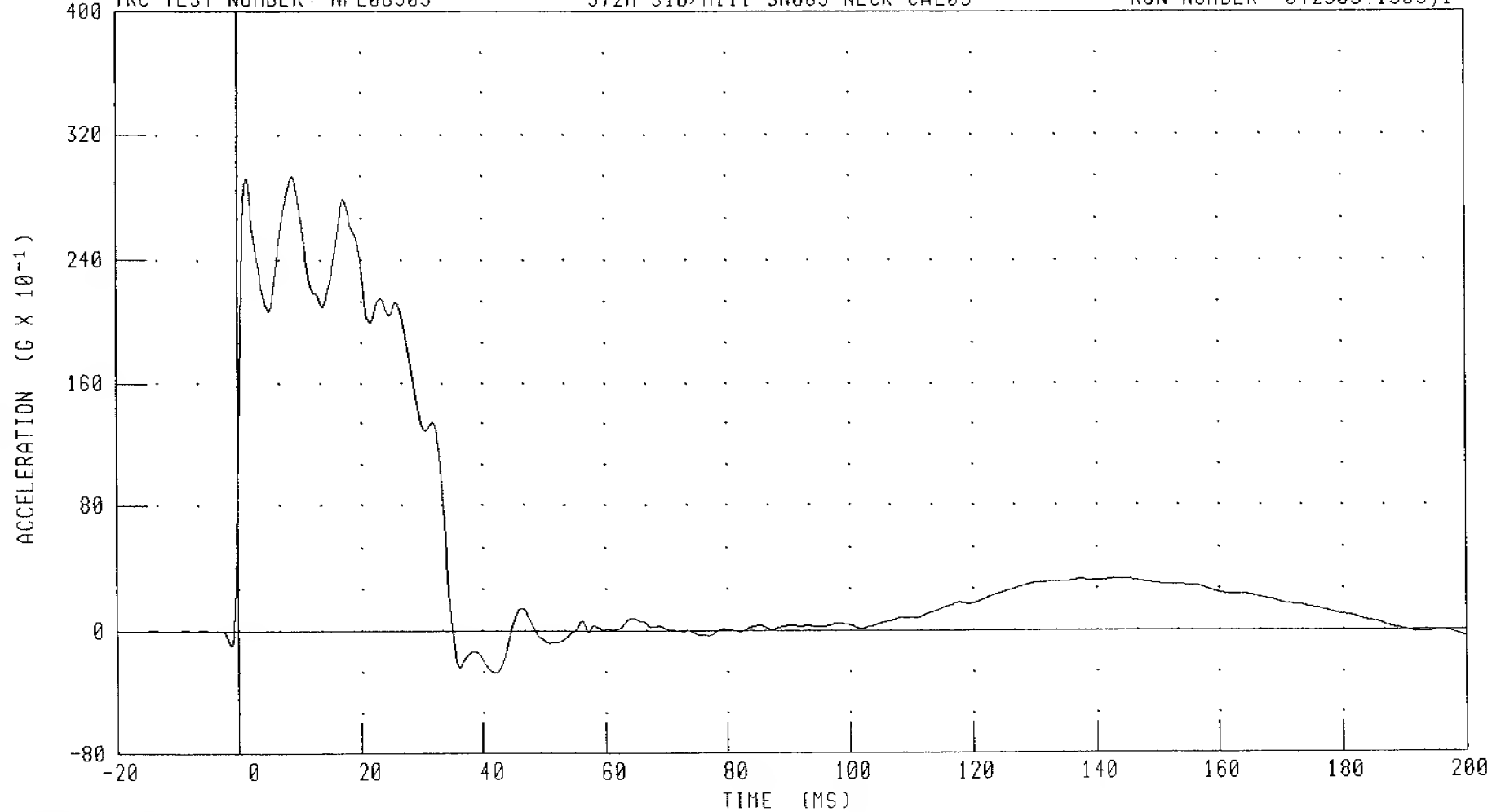
572M SID/HIII DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

PENDULUM DECELERATION

TRC TEST NUMBER: NFL06509

572M SID/HIII SN065 NECK CAL09

RUN NUMBER: 042503.1309;1



CHANNEL: PENXC

FILTER: CH. CLASS 180

PEAK DATA: 29.28 G @ 8.96 MS; -2.73 G @ 42.08 MS

C-79

030422-1

572M SID/HIII DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

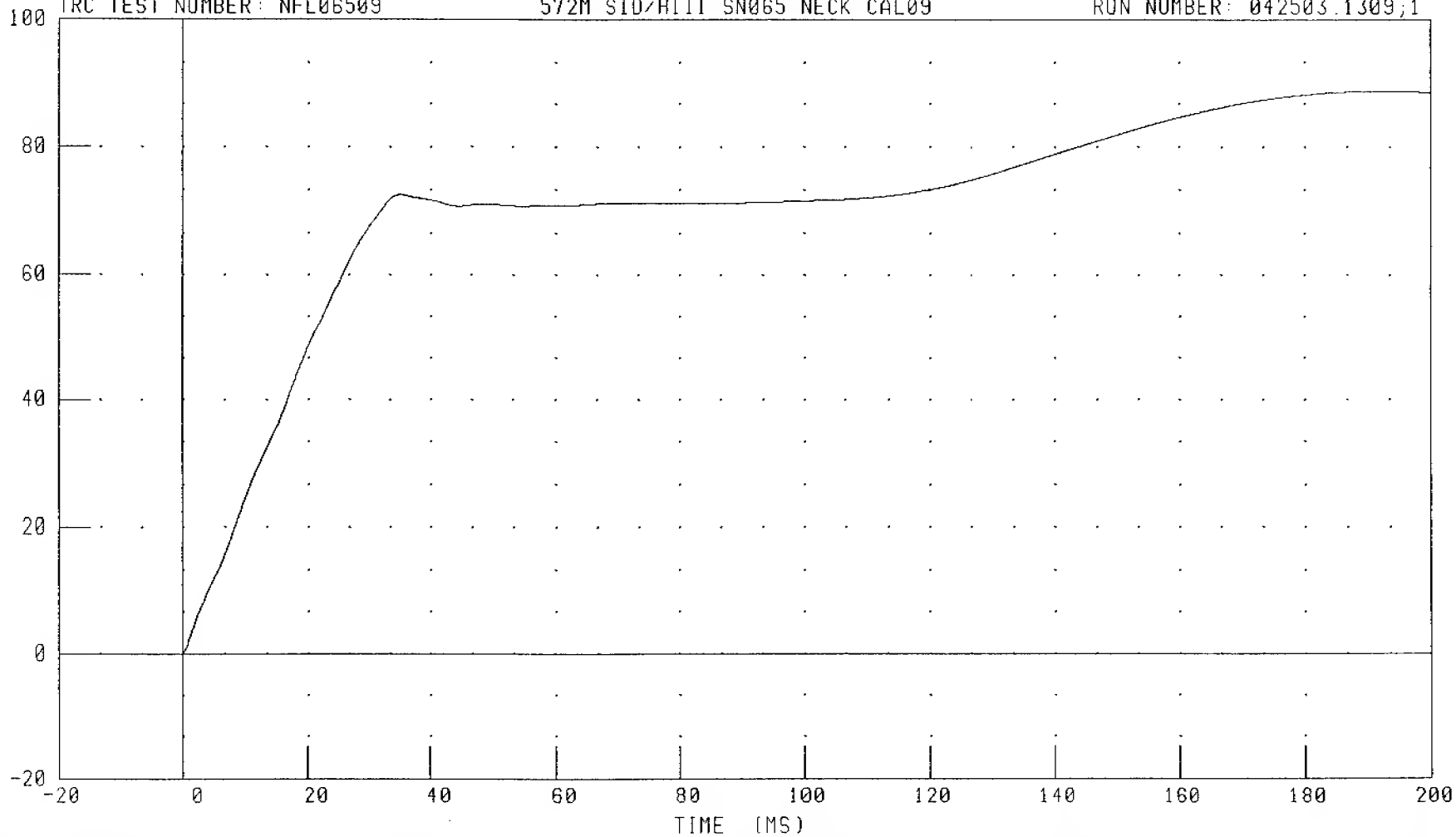
INTEGRATED PENDULUM VELOCITY

TRC TEST NUMBER: NFL06509

572M SID/HIII SN065 NECK CAL09

RUN NUMBER: 042503.1309;1

C-80
VELOCITY (M/S X 10⁻¹)



CHANNEL: PENXVI FILTER: CH. CLASS 180

PEAK DATA 8.87 M/S @ 190.48 MS; -0.01 M/S @ -0.72 MS

030422-1

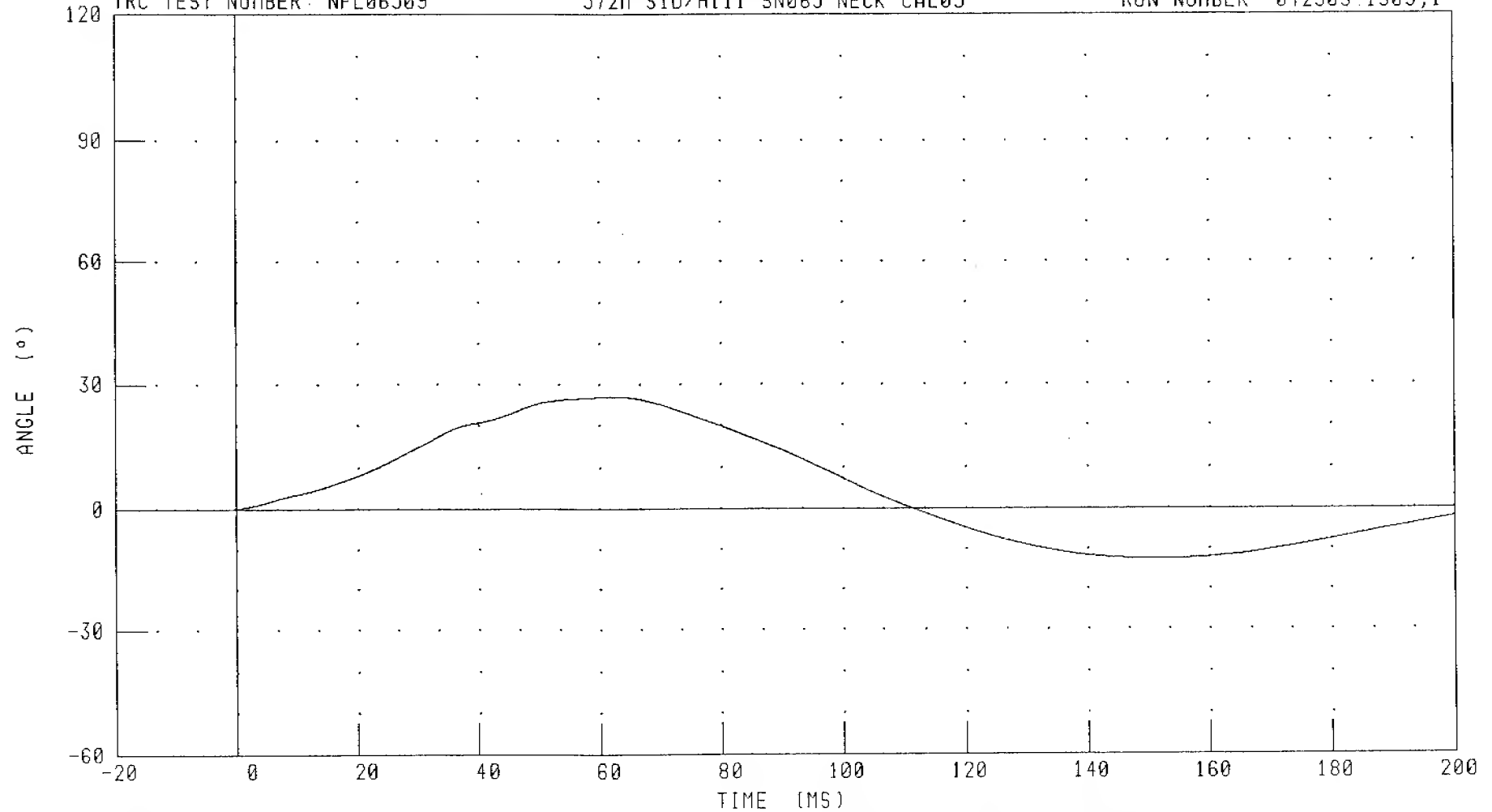
572M SID/HIII DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

ROTATION ABOUT BASE OF NECK

TRC TEST NUMBER: NFL06509

572M SID/HIII SN065 NECK CAL09

RUN NUMBER: 042503.1309;1



CHANNEL: BETA

FILTER: CH. CLASS 60

PEAK DATA: 26.93 ° @ 62.56 MS; -12.54 ° @ 150.72 MS

C-81

030422-1

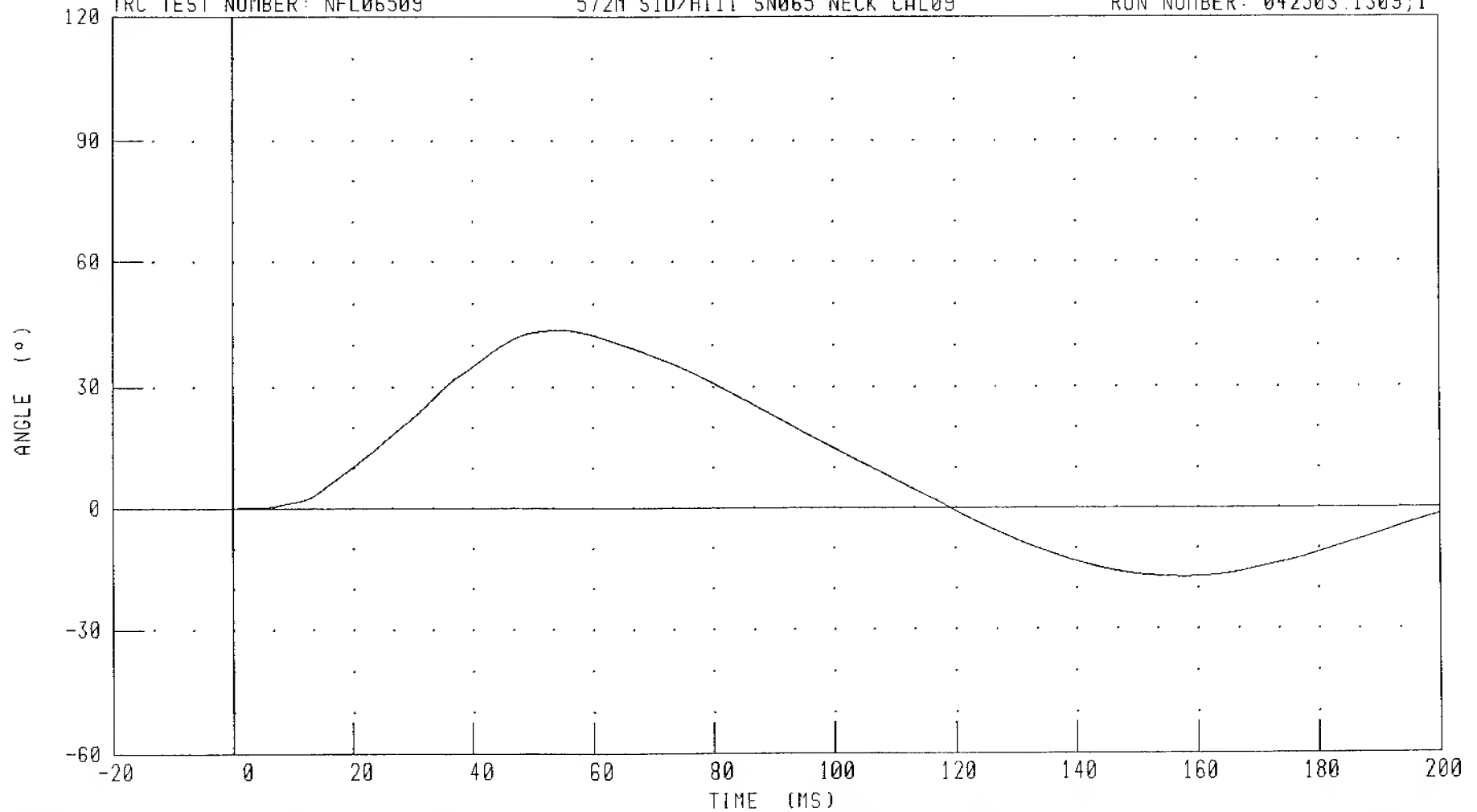
572M SID/HIII DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

ROTATION ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: NFL06509

572M SID/HIII SN065 NECK CAL09

RUN NUMBER: 042503.1309;1



CHANNEL: THETA

FILTER: CH. CLASS 60

PEAK DATA: 43.65 ° @ 54.72 MS; -17.24 ° @ 157.76 MS

030422-1

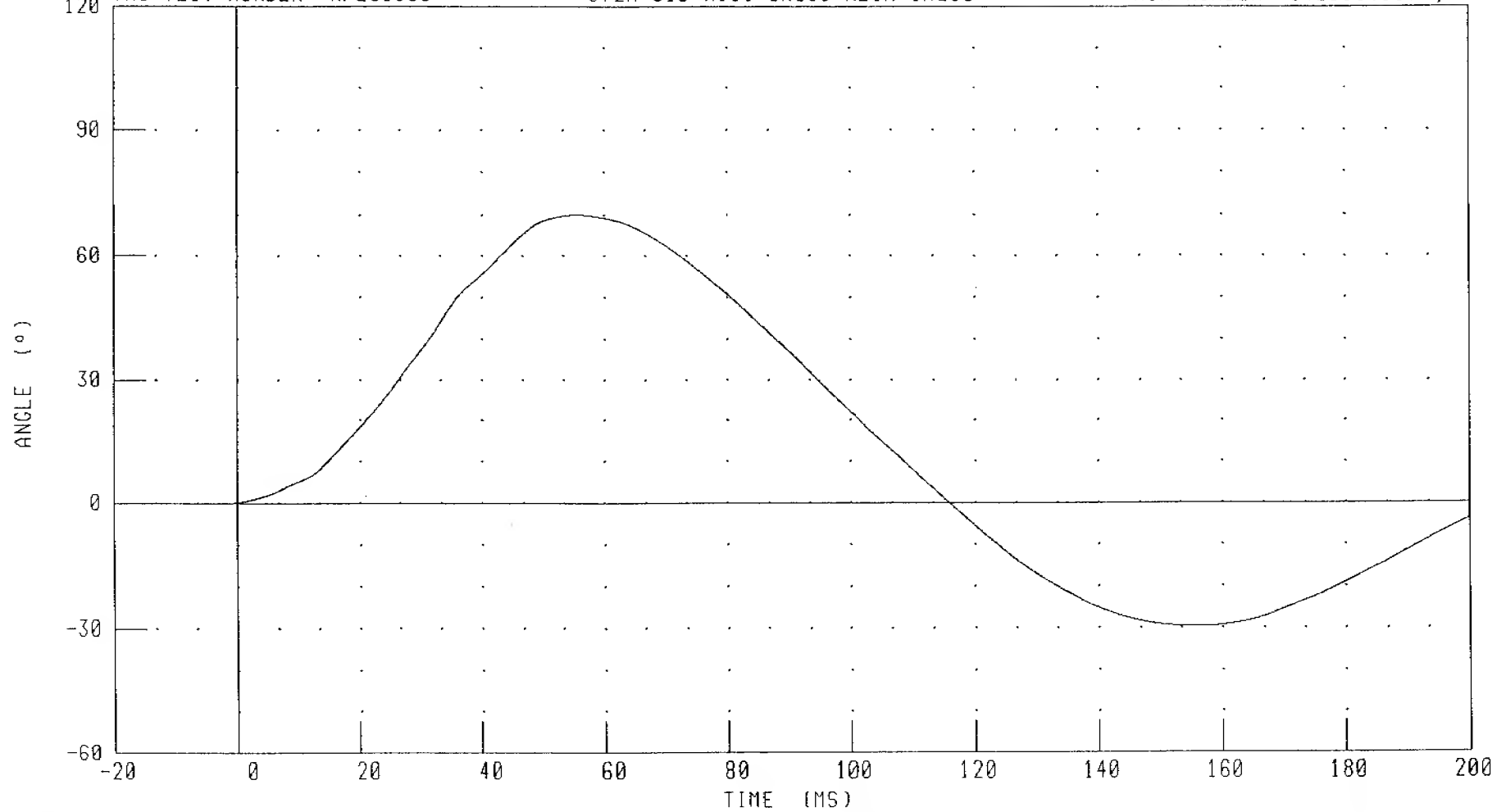
572M SID/HIII DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

TOTAL ROTATION

TRC TEST NUMBER: NFL06509

572M SID/HIII SN065 NECK CAL09

RUN NUMBER: 042503.1309;1



030422-1

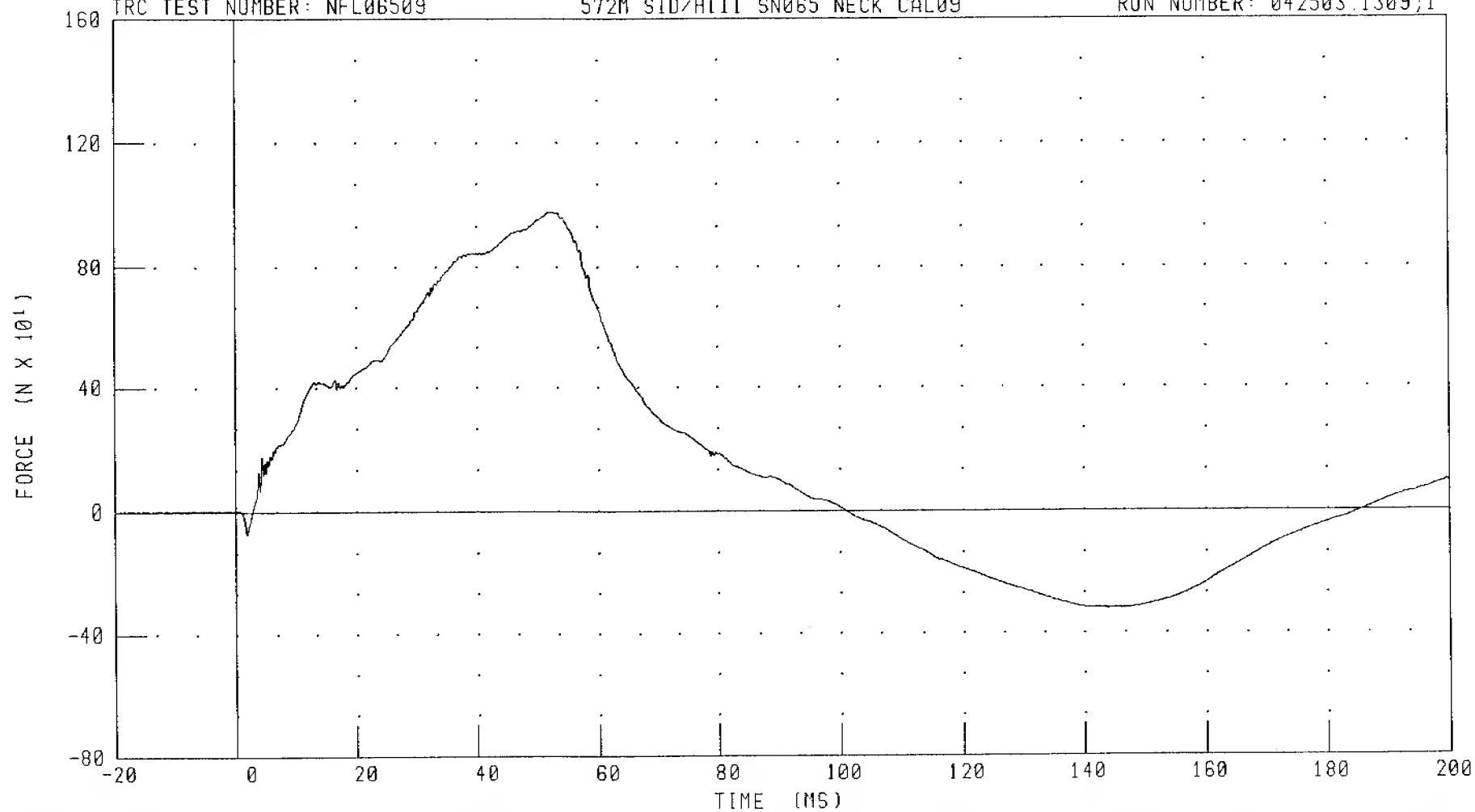
572M SID/HIII DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

NECK FORCE Y AXIS

TRC TEST NUMBER: NFL06509

572M SID/HIII SN065 NECK CAL09

RUN NUMBER: 042503.1309;1



CHANNEL: NEKYF

FILTER: CH CLASS 1000

PEAK DATA: 978.96 N @ 52.08 MS; -318.12 N @ 143.84 MS

C-84

030422-1

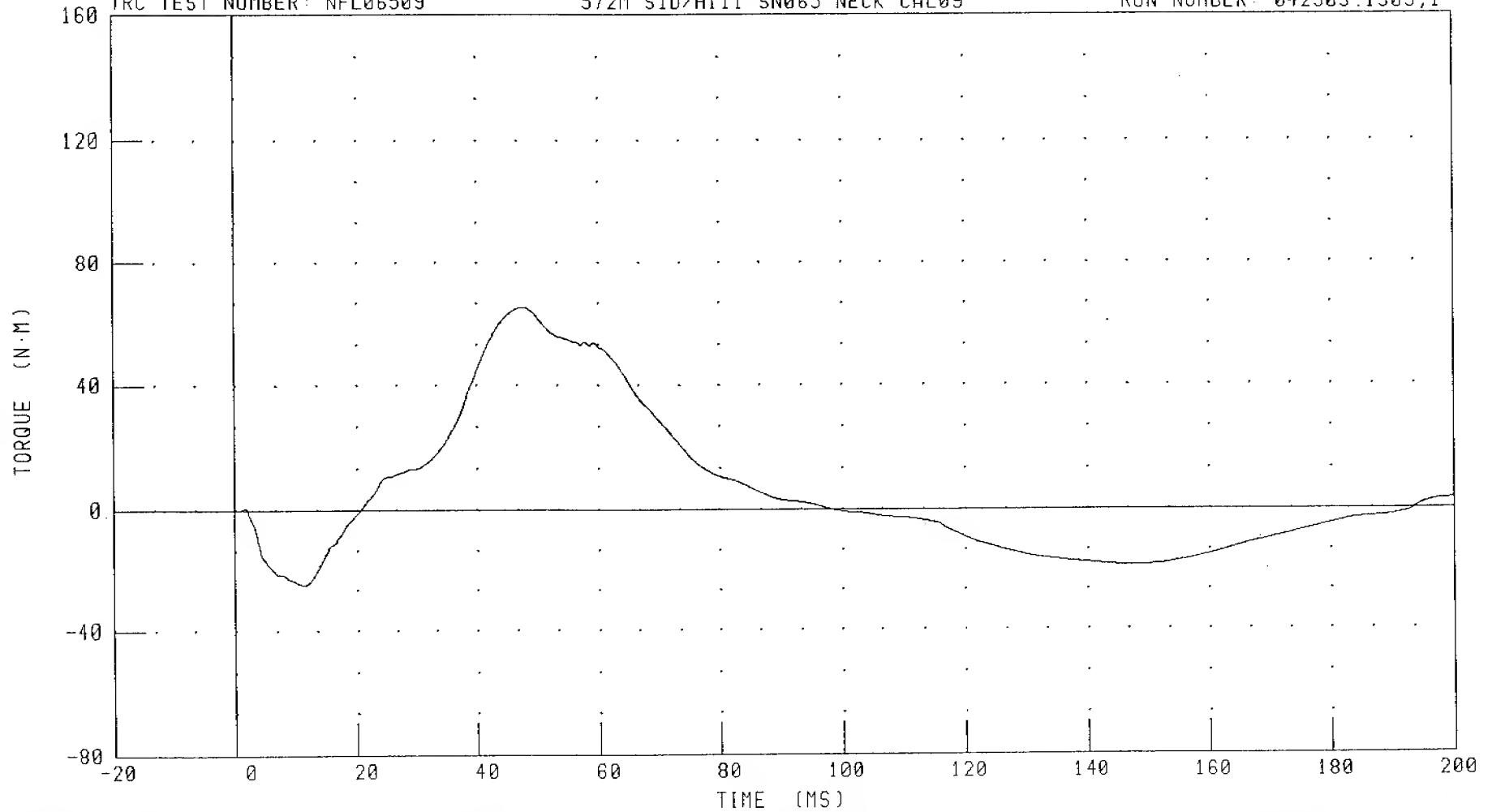
572M SID/HIII DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

NECK MOMENT X AXIS

TRC TEST NUMBER: NFL06509

572M SID/HIII SN065 NECK CAL09

RUN NUMBER: 042503.1309;1



CHANNEL: NEKXM

FILTER: CH. CLASS 600

PEAK DATA: 65.37 N·m @ 47.44 ms; -24.87 N·m @ 11.28 ms

C-85

030422-1

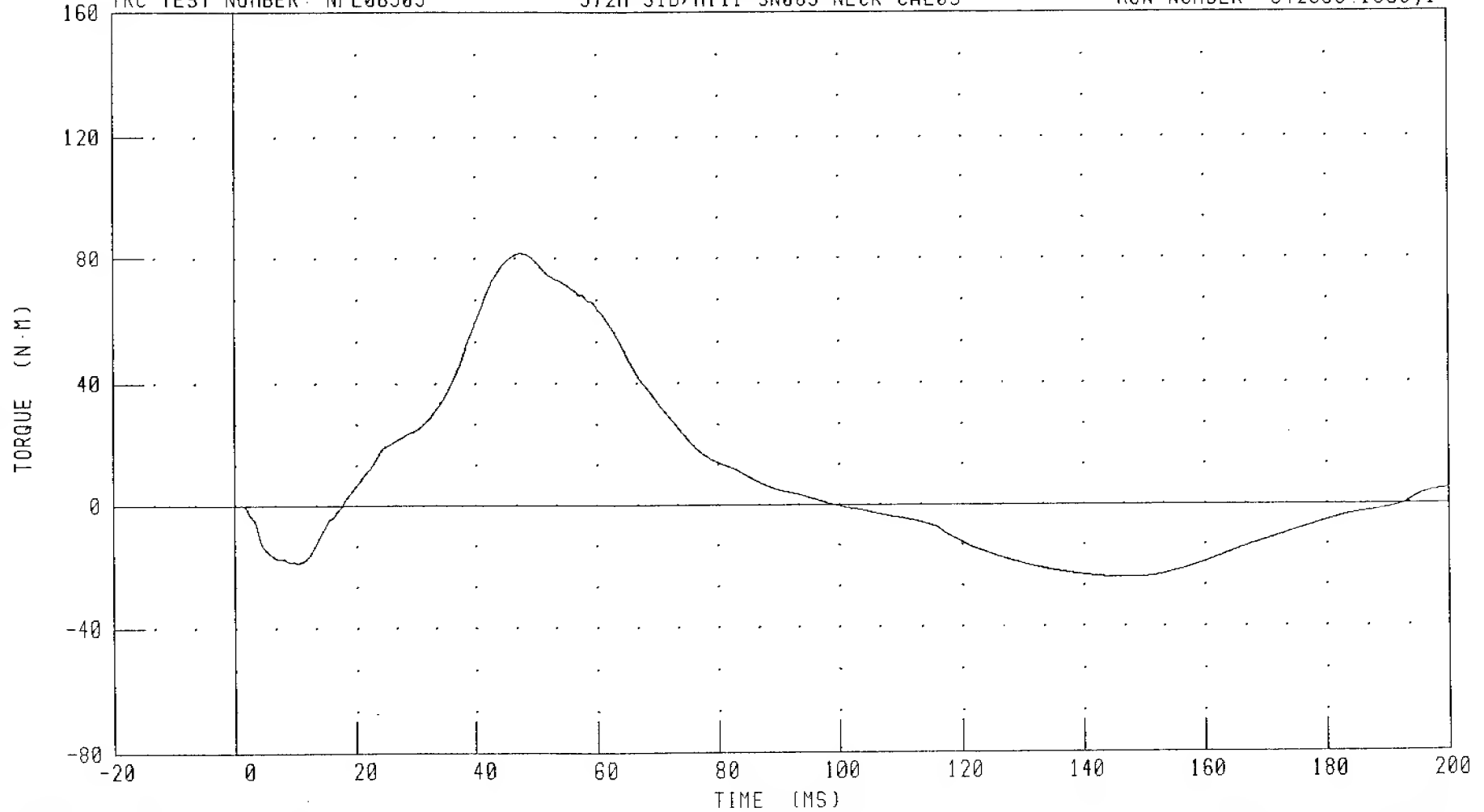
572M SID/HIII DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

TOTAL MOMENT ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: NFL06509

572M SID/HIII SN065 NECK CAL09

RUN NUMBER: 042503.1309;1



CHANNEL: NEKOM

FILTER: CH. CLASS 600

030422-1

TRANSPORTATION RESEARCH CENTER INC.

LATERAL THORAX IMPACT TEST

SIDE IMPACT DUMMY

25-APR-03

LEFT SIDE CONFIGURATION

TRC INC.

TEST NO: STL06509

572F SID SN065 L.THORAX CAL09

TEST PARAMETER	SPECIFICATION (ABSOLUTE VALUE)	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	26.0 %
PENDULUM VELOCITY	4.21 - 4.33 M/S	4.25 M/S
PEAK ACCELERATION: UPPER RIB BAR	37 - 46 G	40.2 G
PEAK ACCELERATION: LOWER RIB BAR	37 - 46 G	39.1 G
PEAK ACCELERATION: LOWER THORACIC SPINE	15 - 22 G	20.1 G

TEST MEETS SPECIFICATIONS

TECHNICIAN 

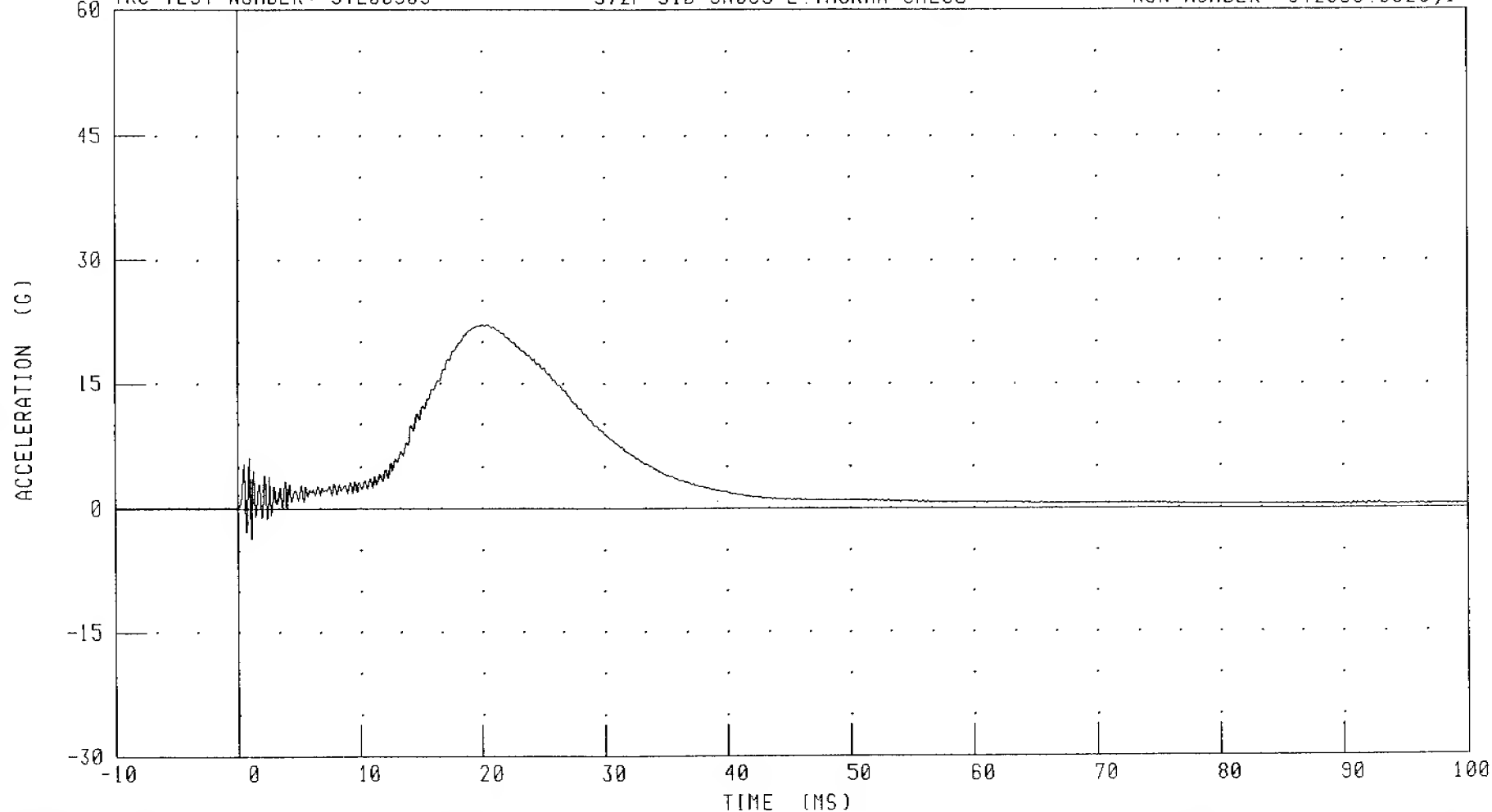
RUN NUMBER: 042503.0928;1

PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)
PENDULUM DECELERATION

TRC TEST NUMBER: STL06509

572F SID SN065 L THORAX CAL09

RUN NUMBER: 042503.0928;1



CHANNEL: PENXC

FILTER: CH. CLASS 1000

PEAK DATA: 22.11 G @ 20.48 MS; -3.65 G @ 1.04 MS

030422-1

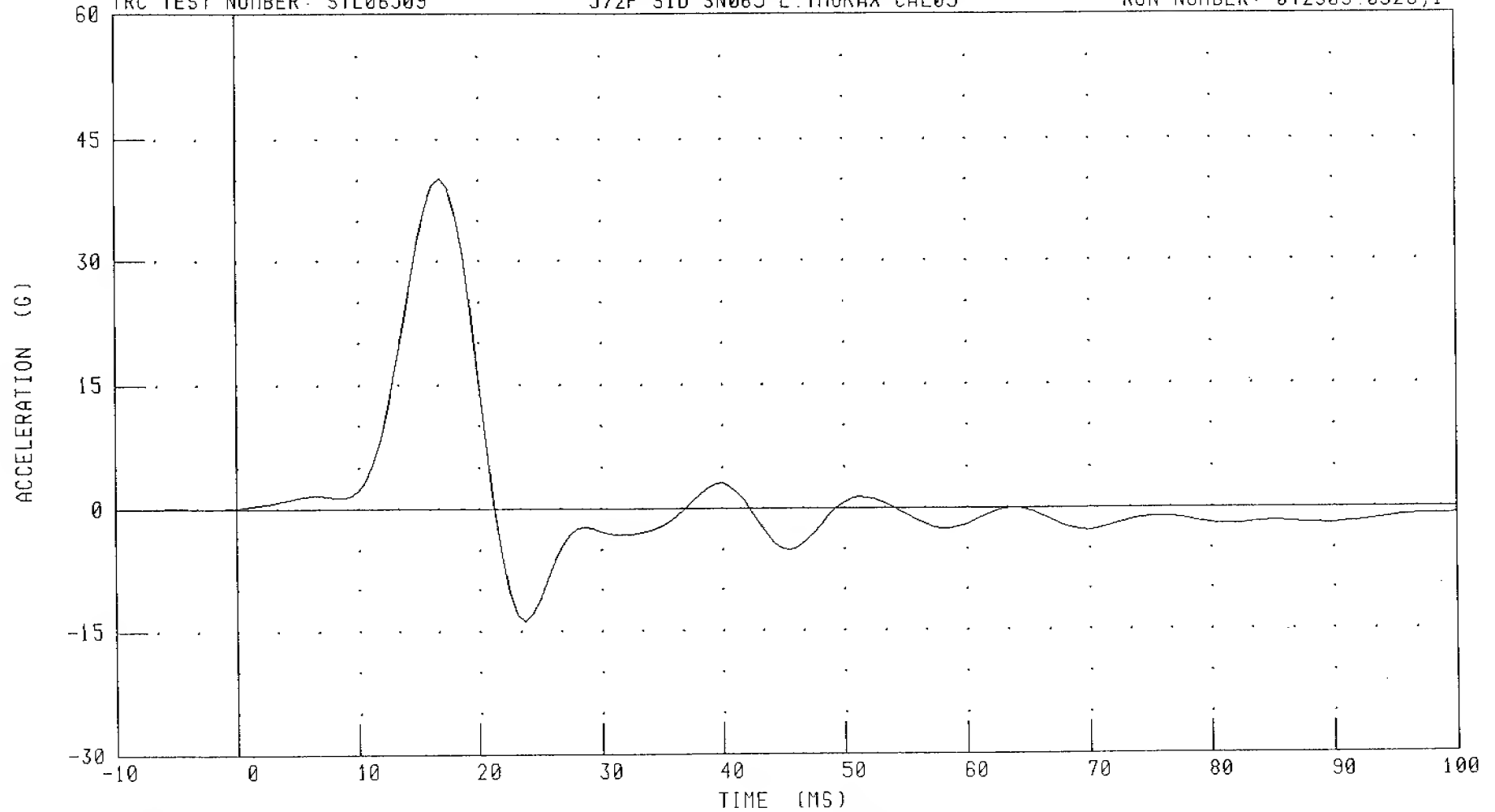
PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)

LEFT UPPER RIB ACCELERATION Y AXIS

TRC TEST NUMBER: STL06509

572F SID SN065 L THORAX CAL09

RUN NUMBER: 042503.0928;1



CHANNEL: LURYG

FILTER: FIR 100

PEAK DATA: 40.25 G @ 16.87 MS; -13.82 G @ 23.75 MS

030422-1

PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)

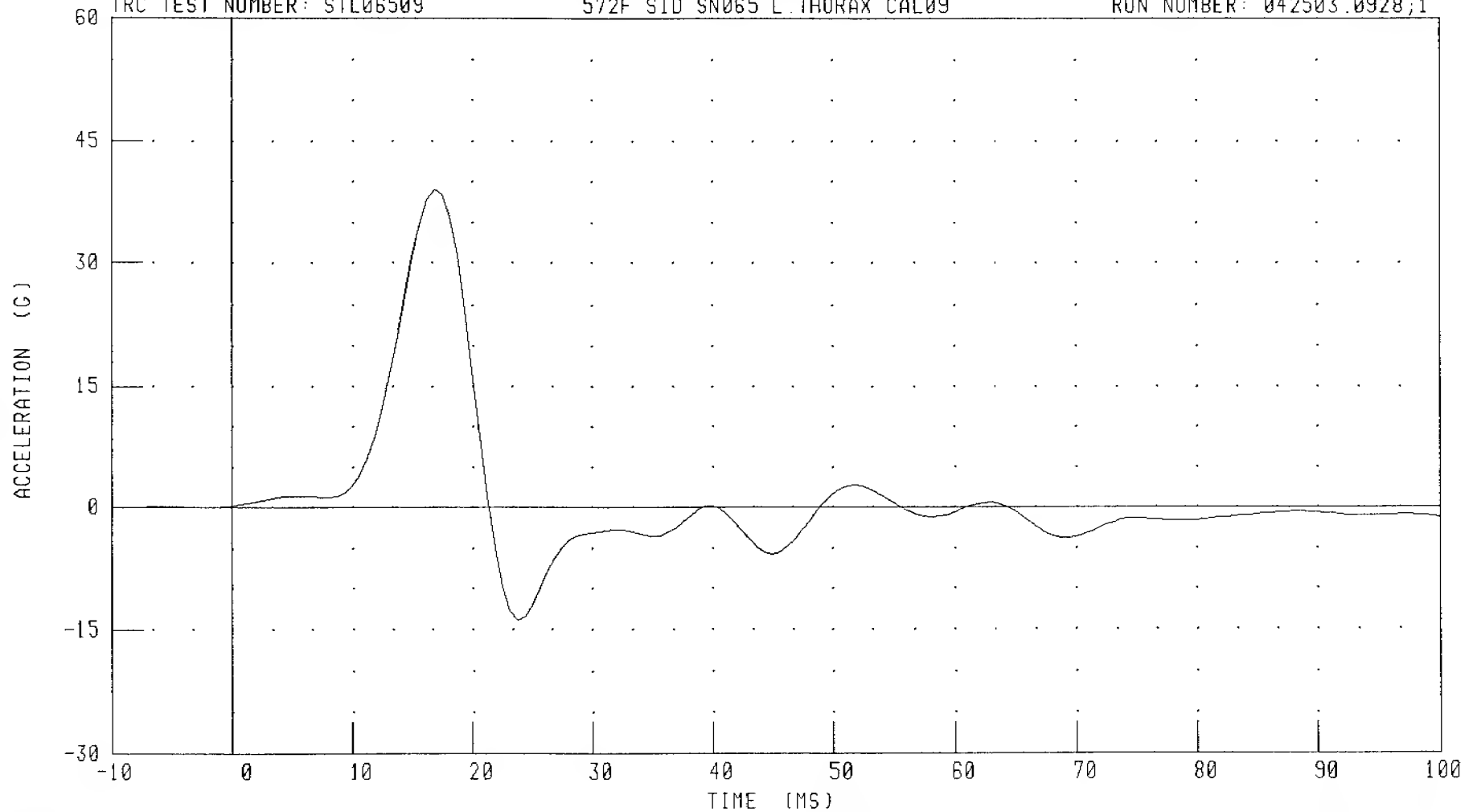
LEFT LOWER RIB ACCELERATION Y AXIS

TRC TEST NUMBER: STL06509

572F SID SN065 L THORAX CAL09

RUN NUMBER: 042503.0928;1

C-90



CHANNEL: LLRYG

FILTER: FIR 100

PEAK DATA: 39.09 G @ 16.87 MS; -13.87 G @ 23.75 MS

030422-1

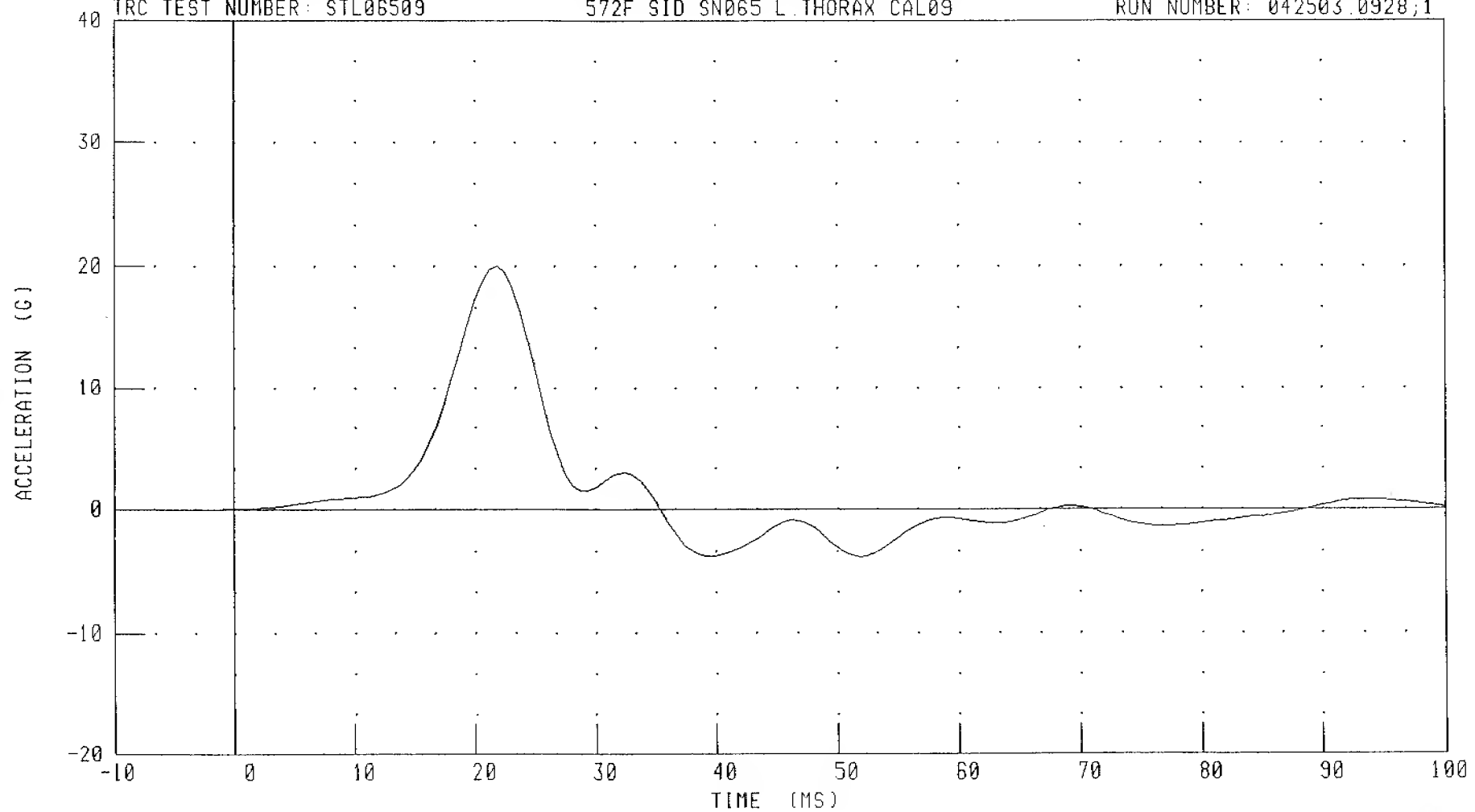
PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)

LOWER SPINE ACCELERATION Y AXIS

TRC TEST NUMBER: STL06509

572F SID SN065 L THORAX CAL09

RUN NUMBER: 042503.0928;1



CHANNEL: T12YG

FILTER: FIR 100

PEAK DATA: 20.07 G @ 21.88 MS; -3.80 G @ 51.88 MS

030422-1

Transportation Research Center Inc.

572B Abdomen Compression Test

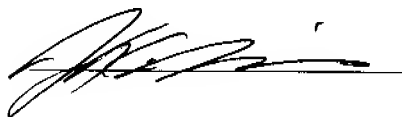
IIII SID Serial No. 065 Calibration No. 09 - 1

Test Date 04/25/2003

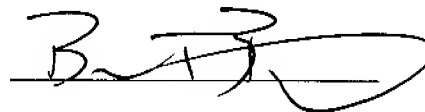
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	25 %	Yes
Displacement Rate	6.35 - 8.89 mm/s	7.3 - 8.0 mm/s	Yes
Data Within Required Corridor	Yes	Yes	Yes

Comments:

Technician



Approved



04.25.2003 10:38:12 97

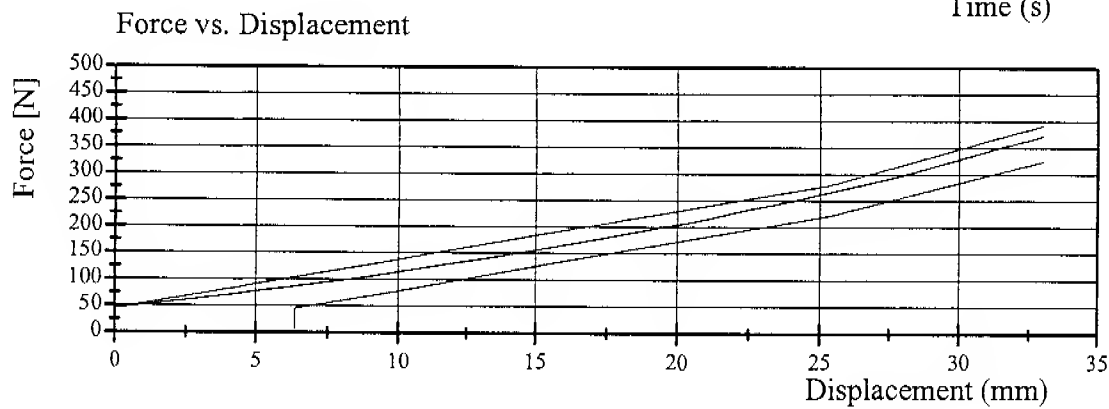
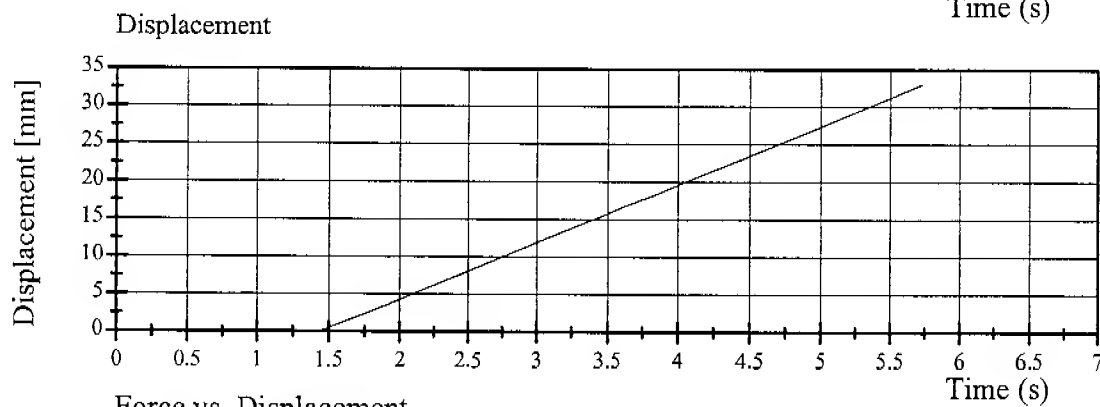
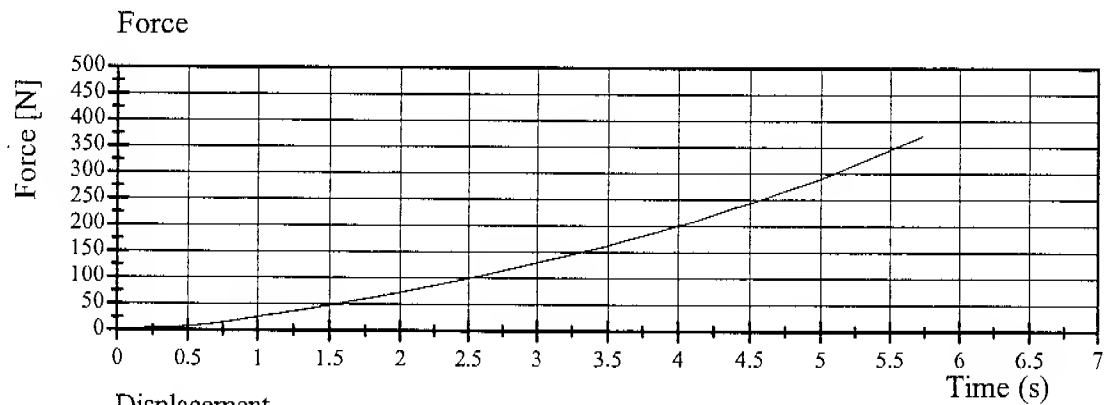


Transportation Research Center Inc.

572B Abdomen Compression Test

HIII SID Serial No. 065 Calibration No. 09 - 1

Test Date 04/25/2003



TRANSPORTATION RESEARCH CENTER INC.

LUMBAR FLEXION TEST

SID PART 572B

CAL DATE: 25-Apr-03

TRC, INC.

TEST NO: 065C09TF1

572B SN 065 TORSO FLEX CAL 09

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 – 25.6° C	21.1 °C
RELATIVE HUMIDITY	10 – 70 %	25 %
FORCE AT 0 DEG. FLEXION	-27 – 27 N	0 N
FORCE AT 20 DEG OF FLEXION	98 – 151 N	124.6 N
FORCE AT 30 DEG OF FLEXION	151 – 205 N	164.6 N
FORCE AT 40 DEG OF FLEXION	205 – 258 N	218 N
NET RETURN ANGLE AFTER 3 MINUTES	< 12 °	9 °

TEST MEETS SPECIFICATIONS

TECHNICIAN



TRANSPORTATION RESEARCH CENTER INC.

LATERAL PELVIS IMPACT TEST

SIDE IMPACT DUMMY

25-APR-03

LEFT SIDE CONFIGURATION

TRC INC.

TEST NO: SPL06509

572F SN065 LEFT PELVIS CAL09

TEST PARAMETER	SPECIFICATION (ABSOLUTE VALUE)	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	25.0 %
PENDULUM VELOCITY	4.21 - 4.33 M/S	4.26 M/S
PEAK PELVIC ACCELERATION	40 - 60 G	50.9 G
TIME ABOVE 20 G LEVEL	3 - 7 MS	6.0 MS
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN 

RUN NUMBER: 042503.0934;1

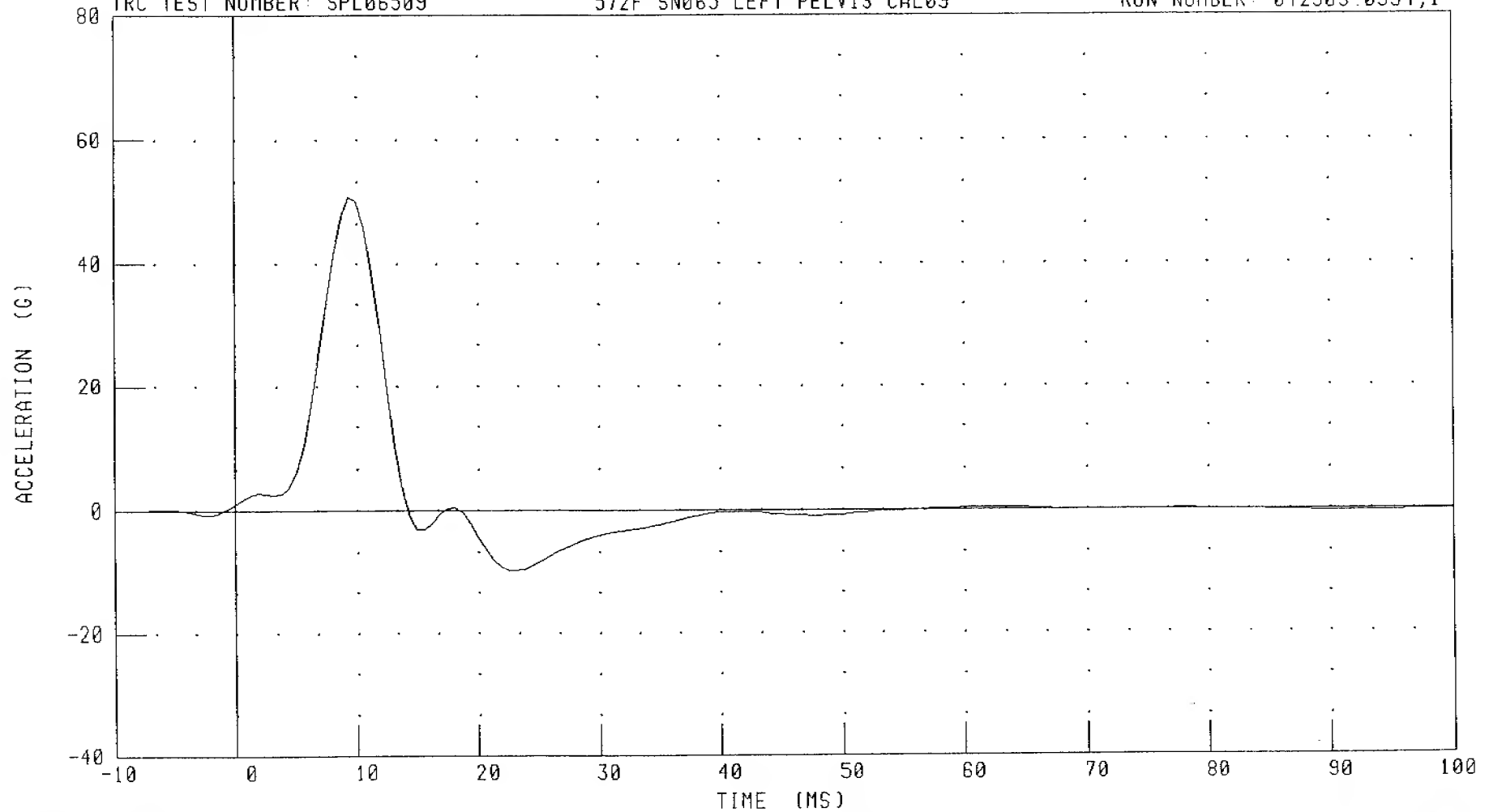
PART 572-F S.I.D. PELVIS CALIBRATION - (LEFT SIDE IMPACT)

PELVIS ACCELERATION Y AXIS

TRC TEST NUMBER: SPL06509

572F SN065 LEFT PELVIS CAL09

RUN NUMBER: 042503.0934;1



CHANNEL: PEVYG

FILTER: FIR 100

PEAK DATA: 50.85 G @ 9.37 MS; -9.77 G @ 23.13 MS

030422-1

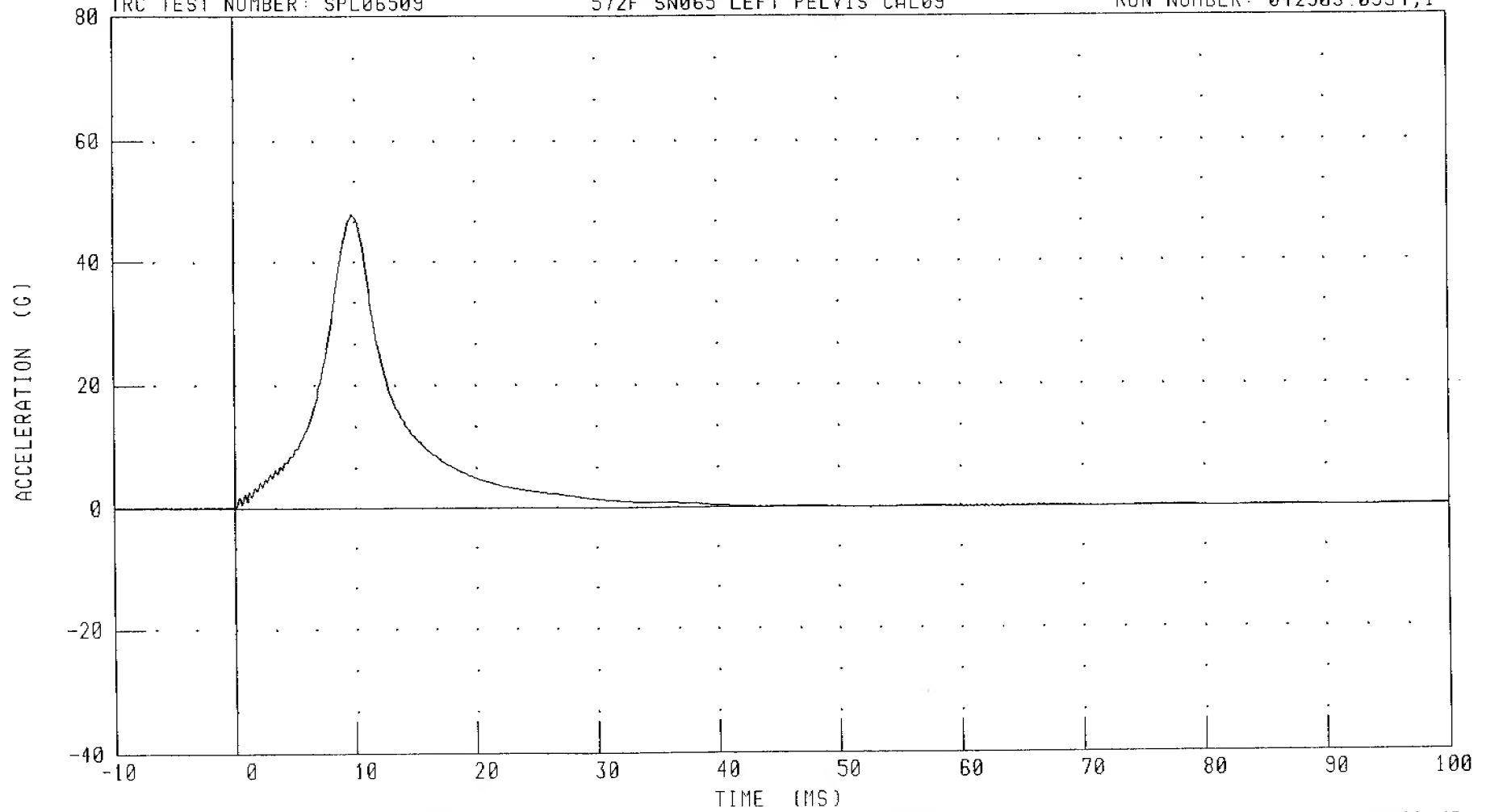
PART 572-F S.I.D. PELVIS CALIBRATION - (LEFT SIDE IMPACT)

PENDULUM DECELERATION

TRC TEST NUMBER: SPL06509

572F SN065 LEFT PELVIS CAL09

RUN NUMBER: 042503.0934;1



CHANNEL: PENXC

FILTER: CH. CLASS 1000

PEAK DATA: 47.95 G @ 9.84 MS; -0.28 G @ 61.52 MS

030422-1

Calibration Test Results

Post-Test

SID-H3: 066

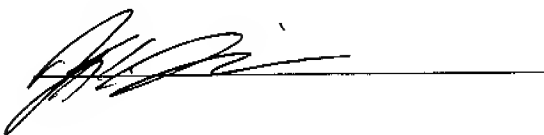
Configured for Left Side Impact

External Dimensions:	The dummy passed all external dimension requirements.
Lateral Head Drop Test:	The head passed all lateral drop test requirements.
Lateral Neck Test:	The neck passed all impact test requirements.
Lateral Thorax Impact Test:	The thorax passed all impact test requirements.
Thoracic Shock Absorber Test:	The thoracic shock absorber passed all test requirements.
Lumbar Flexion Test:	The dummy met the lumbar flexion test requirements.
Abdominal Compression Test:	The abdomen met the compression test requirements.
Pelvis Impact Test:	The lateral pelvis passed all impact test requirements.

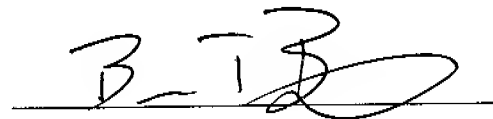
Transportation Research Center Inc.
572F SID Dummy
External Dimensions
Serial No. 066 Calibration No. 08

Test Parameter	Dimension	Specification	Results	Pass
Seated Height	SH	889.0 - 909.3 mm	902 mm	Yes
Rib Height	RH	501.7 - 520.7 mm	507 mm	Yes
Hip Pivot Height	HP	99.1 REF mm	99.1 mm	
Rib From Backline	RD	228.6 - 241.3 mm	238 mm	Yes
Knee Pivot From Backline	KH	510.5 - 525.8 mm	521 mm	Yes
Knee Pivot From Floor	KV	490.2 - 505.5 mm	497 mm	Yes
Hip Width	HW	355.6 - 391.2 mm	387 mm	Yes
Top Rib Width From C/L	RW-1	165.1 - 180.3 mm	170 mm	Yes
Bottom Rib Width From C/L	RW-2	165.1 - 180.3 mm	169 mm	Yes
Difference Between Top & Bottom Rib Width from C/L		<= 2.5 mm	1.0 mm	Yes

Technician



Approved




TRANSPORTATION RESEARCH CENTER INC.

LATERAL HEAD DROP TEST

HYBRIDIII SID DUMMY

28-APR-03

LEFT SIDE CONFIGURATION

TRC INC. TEST NO. HDL06608 572M SID/HIII SN066 HEAD CAL08

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.6 deg. C	21.67 deg. C
RELATIVE HUMIDITY	10 - 70 %	34.00 %
PEAK RESULTANT ACCELERATION	120 - 150 G	128.48 G
PEAK LONGITUDINAL ACCELERATION	15 G MAX	-5.71 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN 

RUN NUMBER: 042803.1349;1

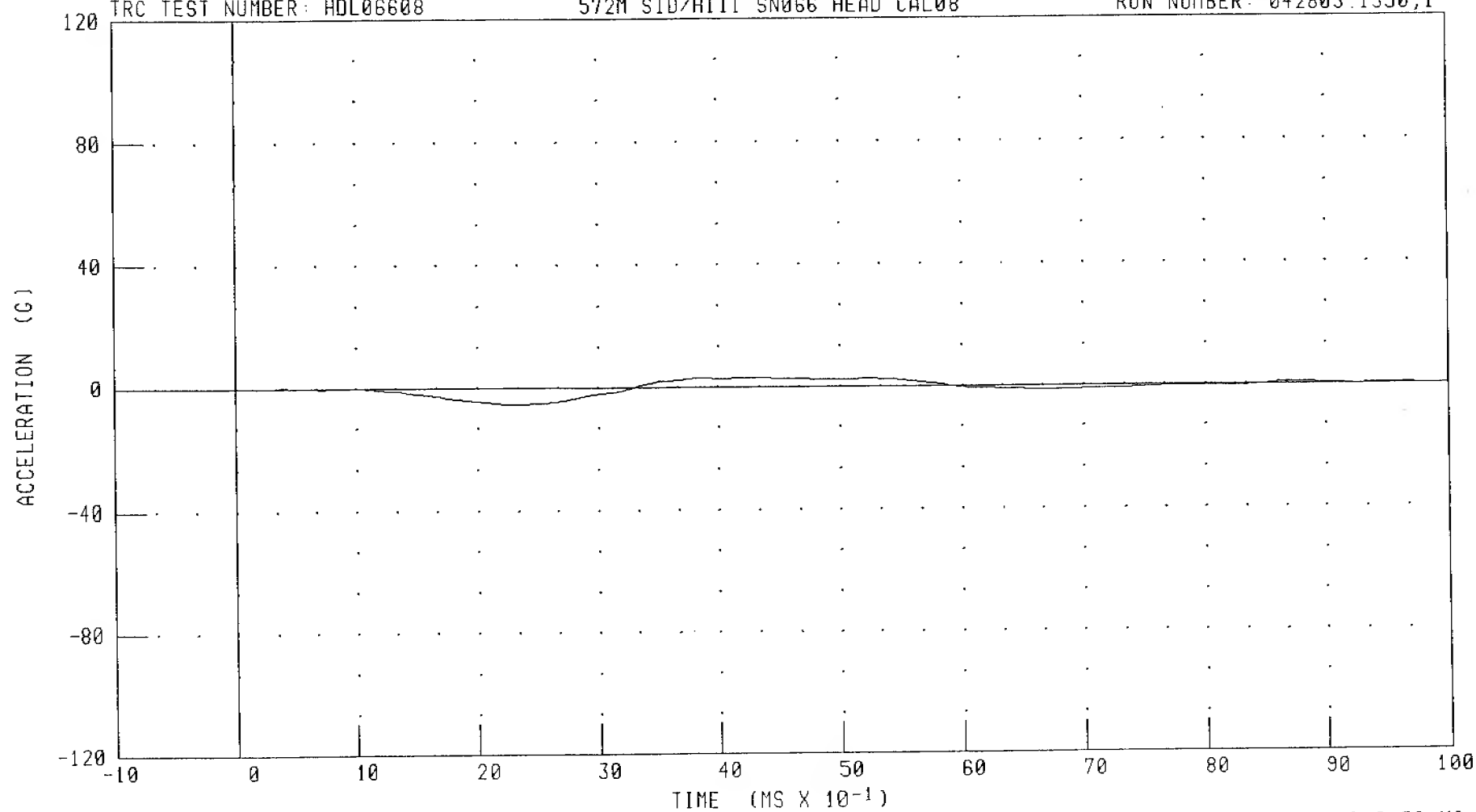
572M SID/HIII DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD ACCELERATION X AXIS

TRC TEST NUMBER: HDL06608

572M SID/HIII SN066 HEAD CAL08

RUN NUMBER: 042803.1350;1



CHANNEL: HEDXC

FILTER: CH. CLASS 1000

C-101

030422-1

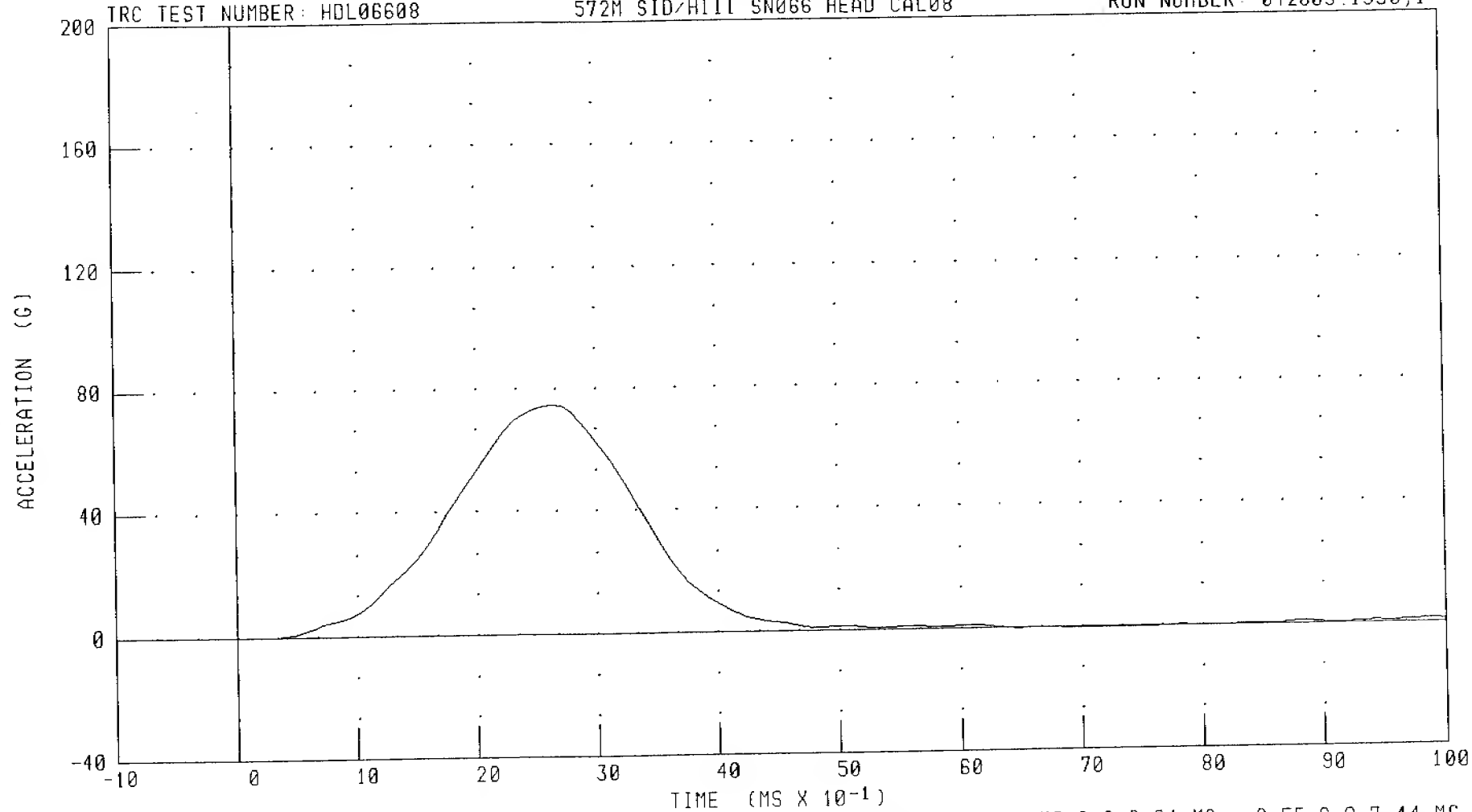
572M SID/HIII DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD ACCELERATION Y AXIS

TRC TEST NUMBER: HDL06608

572M SID/HIII SN066 HEAD CAL08

RUN NUMBER: 042803.1350;1



CHANNEL: HEDYG

FILTER: CH CLASS 1000

PEAK DATA: 74.53 G @ 2.64 MS; -0.55 G @ 74.4 MS

030422-1

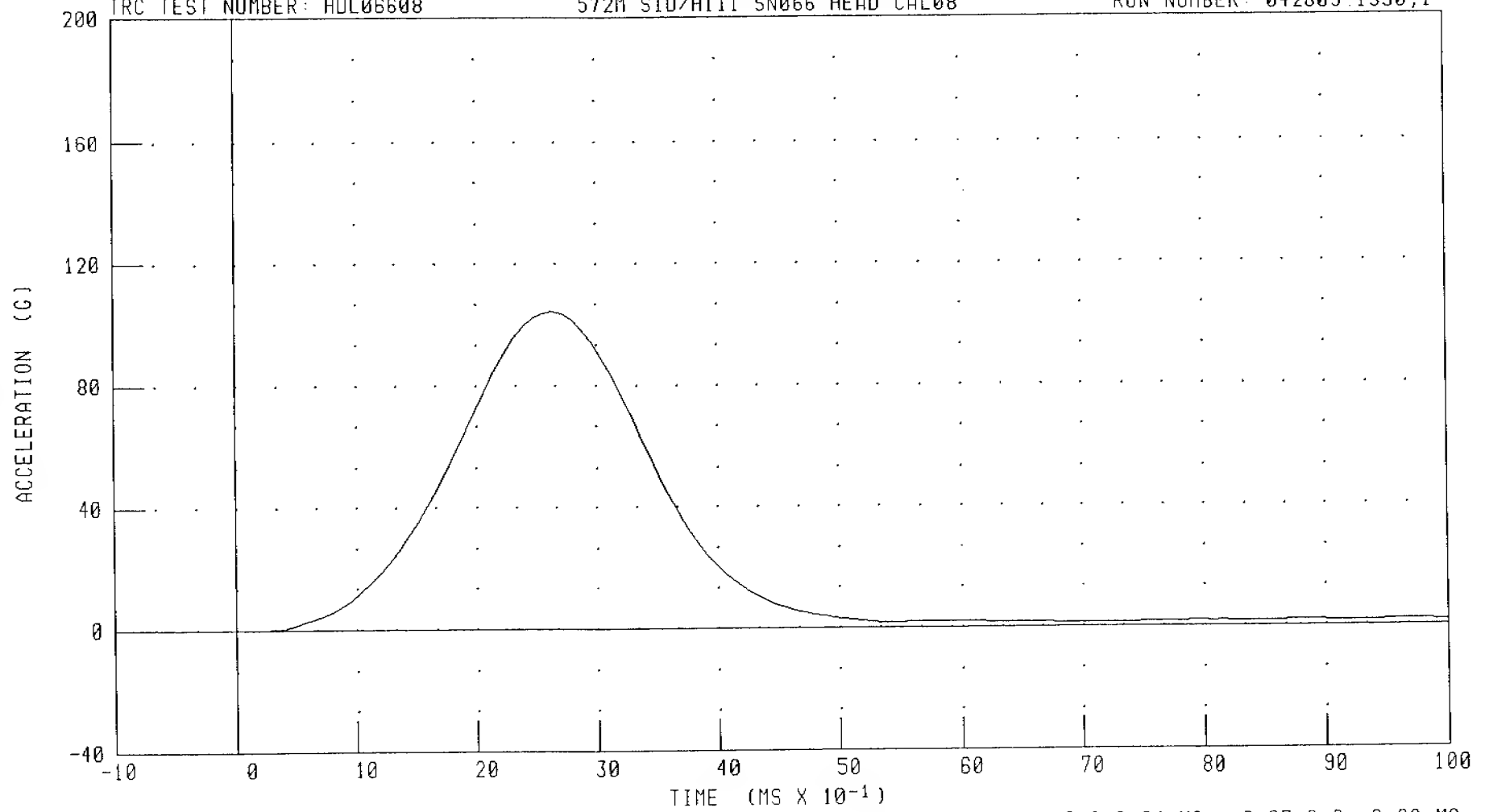
572M SID/HIII DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD ACCELERATION Z AXIS

TRC TEST NUMBER: HDL06608

572M SID/HIII SN066 HEAD CAL08

RUN NUMBER: 042803.1350;1



CHANNEL: HEDZG

FILTER: CH. CLASS 1000

PEAK DATA: 104.54 G @ 2.64 MS; -0.07 G @ -0.80 MS

030422-1

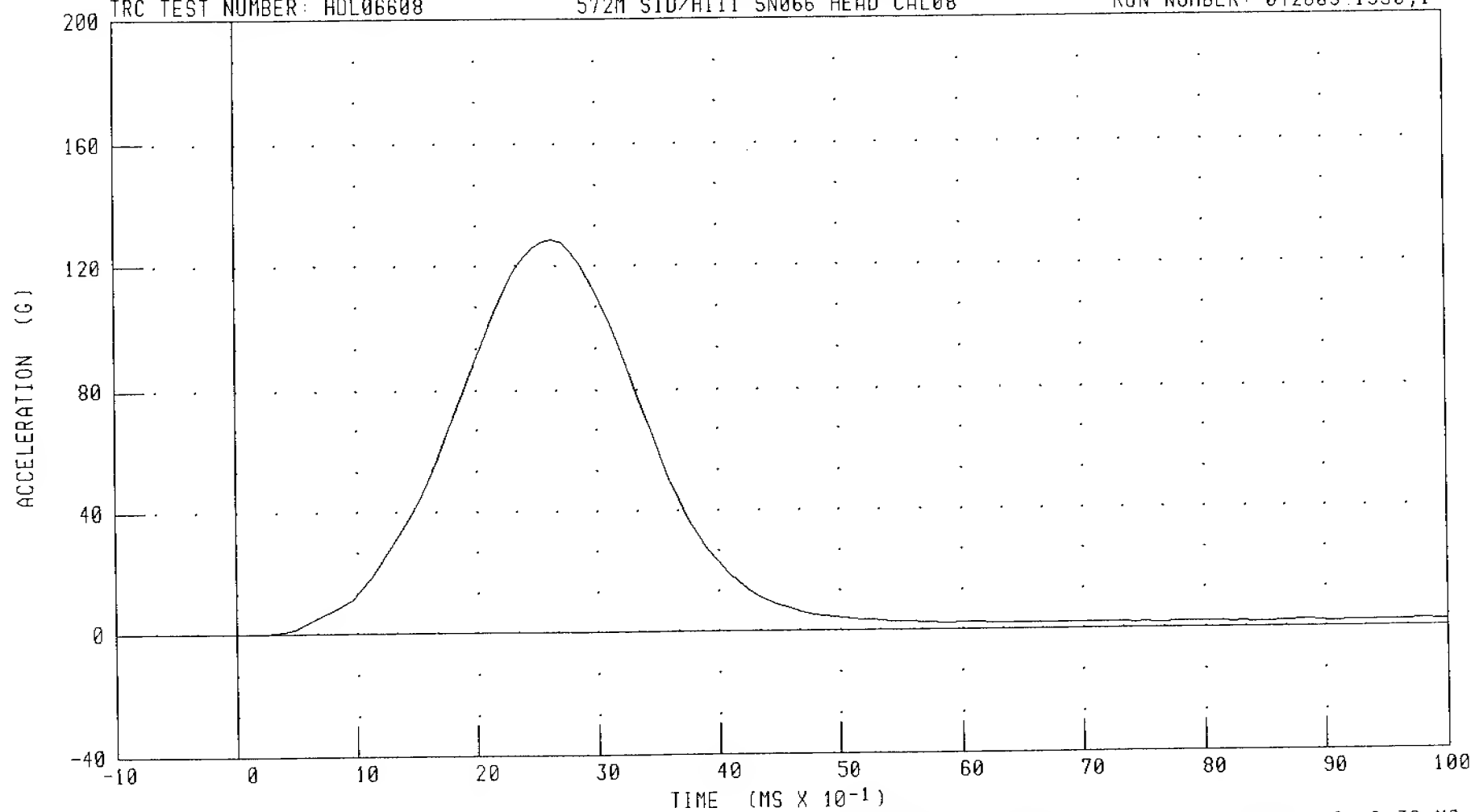
572M SID/HIII DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD RESULTANT ACCELERATION

TRC TEST NUMBER: HDL06608

572M SID/HIII SN066 HEAD CAL08

RUN NUMBER: 042803.1350;1



CHANNEL: HEDRG

FILTER: CH. CLASS 1000

PEAK DATA: 128.48 G @ 2.64 MS; 0.02 G @ -0.32 MS

030422-1

TRANSPORTATION RESEARCH CENTER INC.

LATERAL NECK TEST

HYBRIDIII SID DUMMY

29-APR-03

LEFT SIDE CONFIGURATION

TRC INC.

TEST NO. NFLO6608

572M H3/SID SN066 NECK CAL08

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	20.6 - 22.2 deg. C	21.67 deg. C
RELATIVE HUMIDITY	10 - 70 %	34.00 %
IMPACT VELOCITY	6.89 - 7.13 M/S	7.06 M/S
INTEGRATED VELOCITY	10 MS 1.96 - 2.55 M/S	2.45 M/S
	20 MS 4.12 - 5.10 M/S	4.87 M/S
	30 MS 5.73 - 7.01 M/S	6.80 M/S
	40 - 70 MS 6.27 - 7.64 M/S	7.04 - 7.13 M/S
MAXIMUM MIDSAGGITAL PLANE ROTATION	66 - 82 deg.	71.78 deg.
ROTATION ANGLE DECAY TIME FROM PEAK TO ZERO	58 - 67 MS	61.52 MS
MAXIMUM MOMENT ABOUT OCCIPITAL CONDYLE	73 - 88 NM	78.43 NM
POSITIVE MOMENT DECAY TIME FROM PEAK TO ZERO	49 - 64 MS	57.52 MS
TIME OF MAXIMUM ROTATION AFTER MAXIMUM MOMENT	2 - 16 MS	9.20 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN 

RUN NUMBER: 042903.1118;1

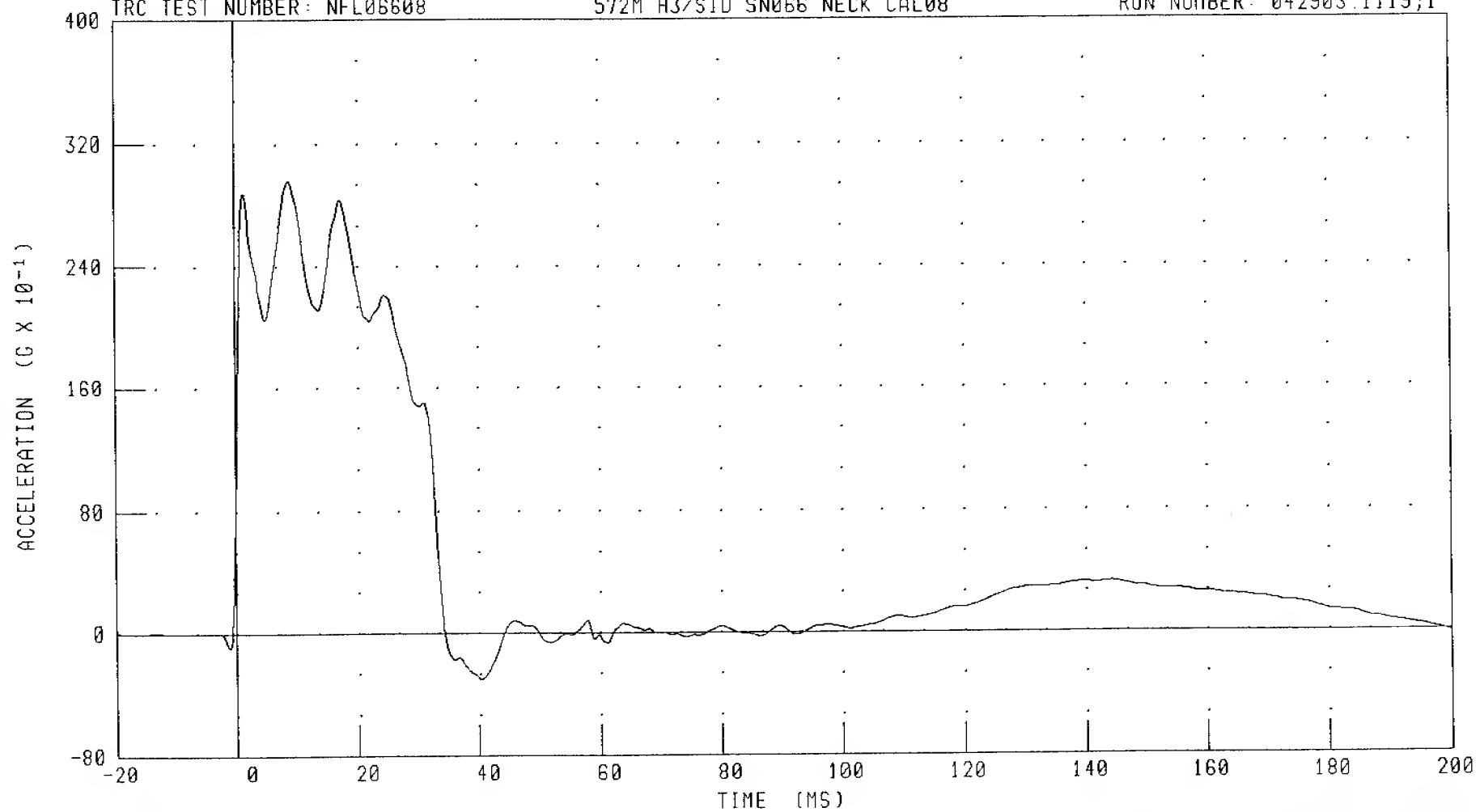
572M H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

PENDULUM DECELERATION

TRC TEST NUMBER: NFL06608

572M H3/SID SN066 NECK CAL08

RUN NUMBER: 042903.1119;1



CHANNEL: PENXG

FILTER: CH. CLASS 180

PEAK DATA: 29.60 G @ 8.80 MS; -3.08 G @ 40.40 MS

C-106

030422-1

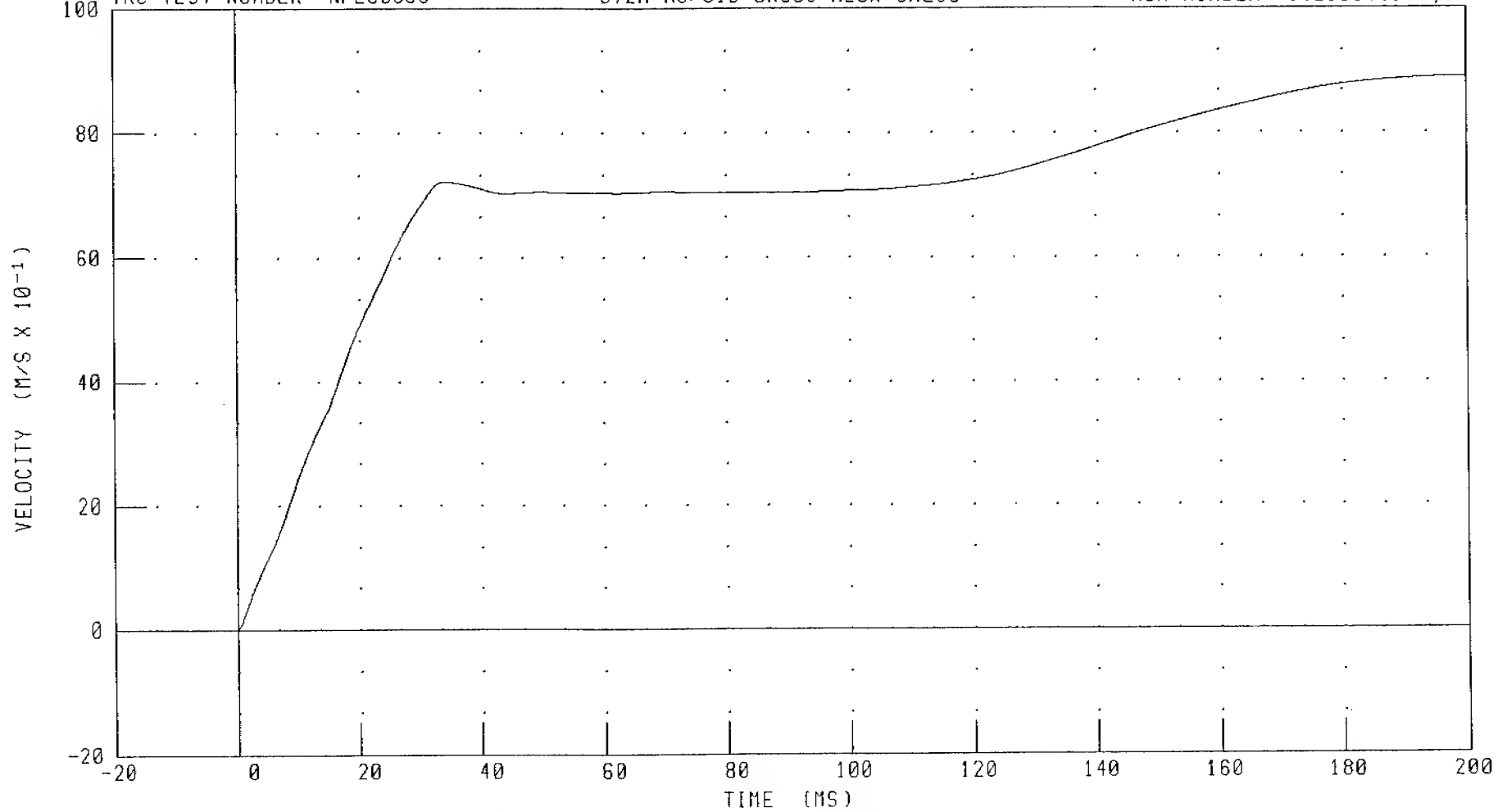
572M H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

INTEGRATED PENDULUM VELOCITY

TRC TEST NUMBER: NFL06608

572M H3/SID SN066 NECK CAL08

RUN NUMBER: 042903.1119;1



CHANNEL: PENXVI FILTER: CH. CLASS 180

PEAK DATA: 8.90 M/S @ 198.72 NS; -0.01 M/S @ -0.72 NS

C-107

030422-1

572M H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

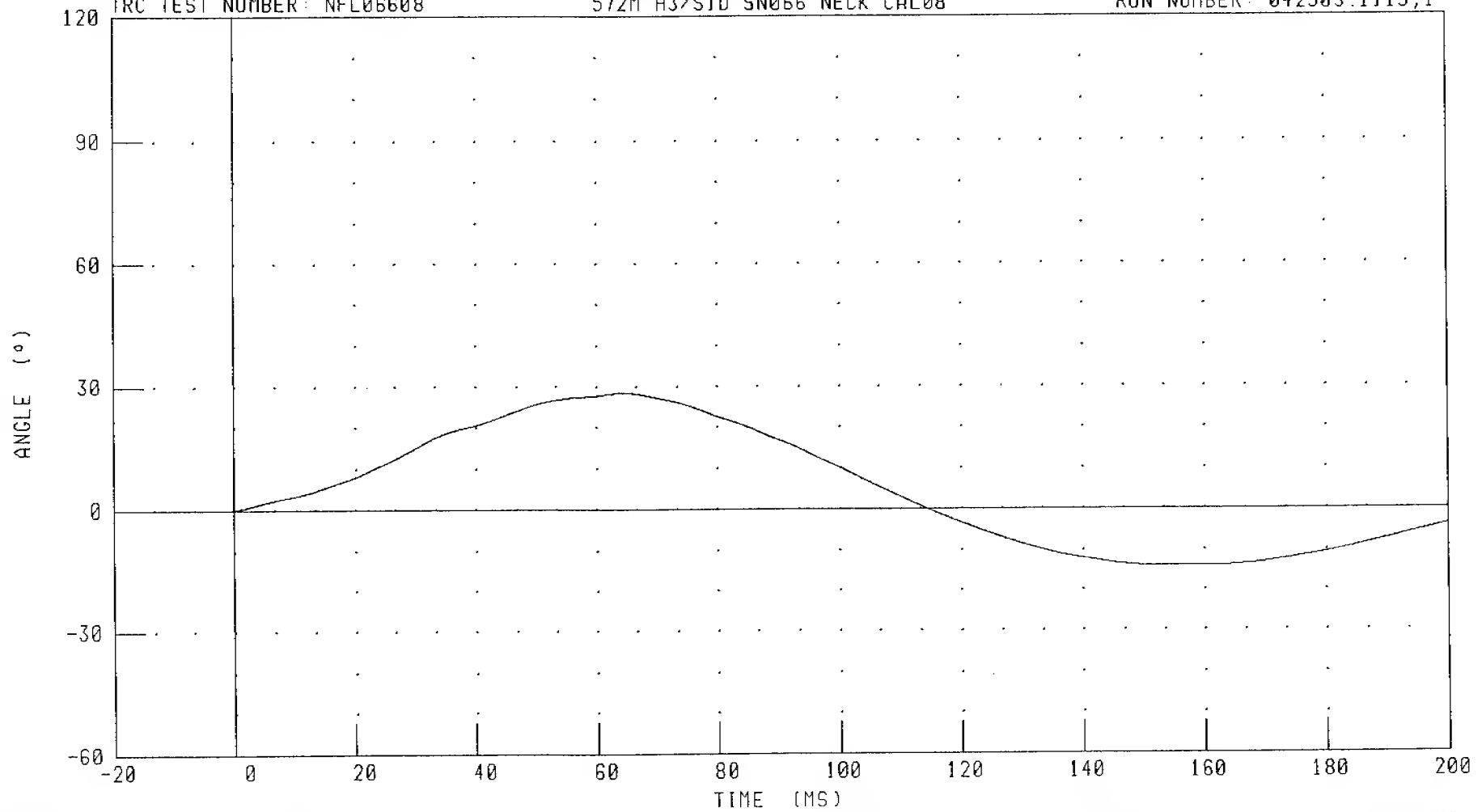
ROTATION ABOUT BASE OF NECK

TRC TEST NUMBER: NFL06608

572M H3/SID SN066 NECK CAL08

RUN NUMBER: 042903.1119;1

C-108



CHANNEL: BETA

FILTER: CH. CLASS 60

PEAK DATA: 28.38 ° @ 64.64 MS; -14.15 ° @ 155.92 MS

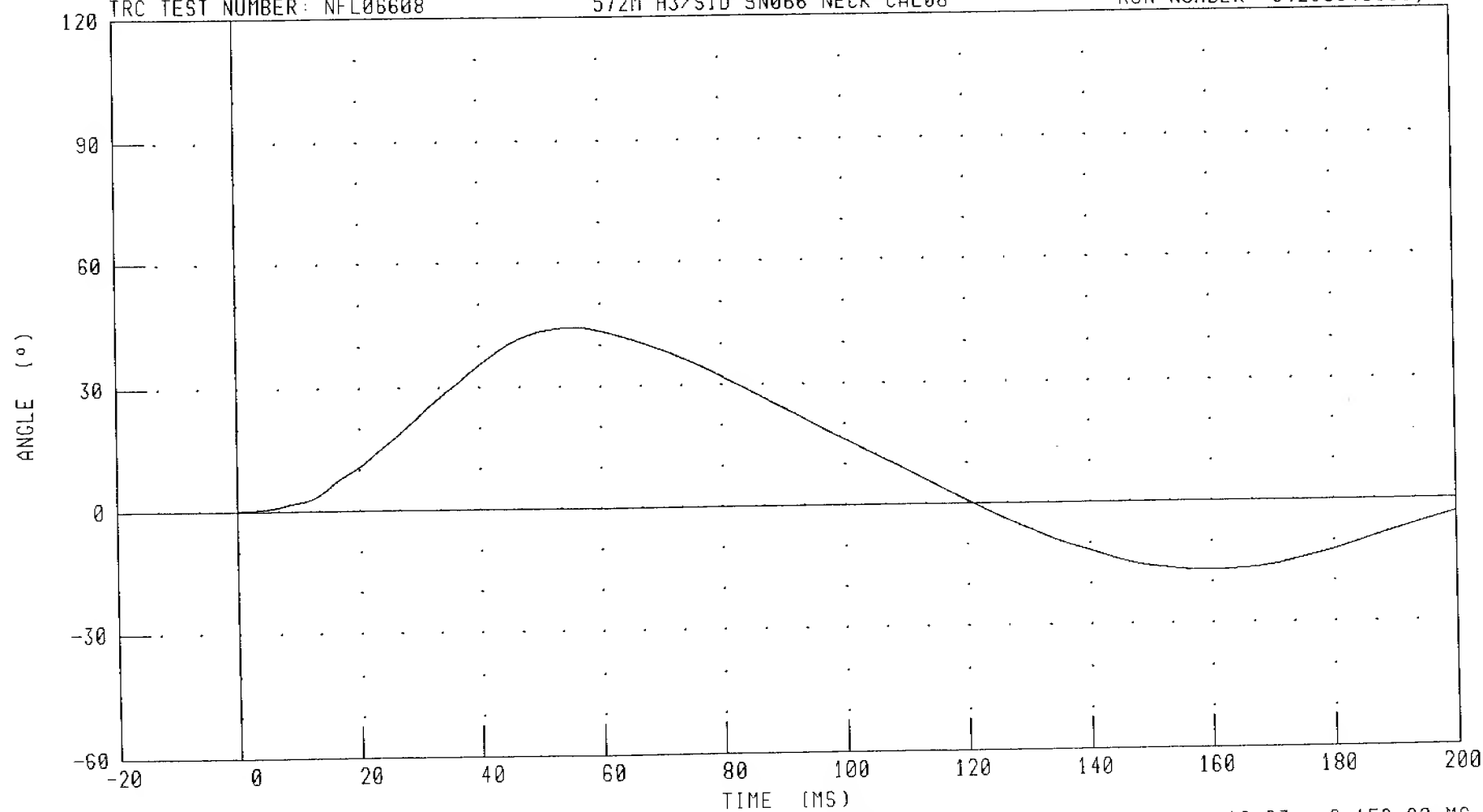
030422-1

572M H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST
ROTATION ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: NFL06608

572M H3/SID SN066 NECK CAL08

RUN NUMBER: 042903.1119;1



C-109

030422-1

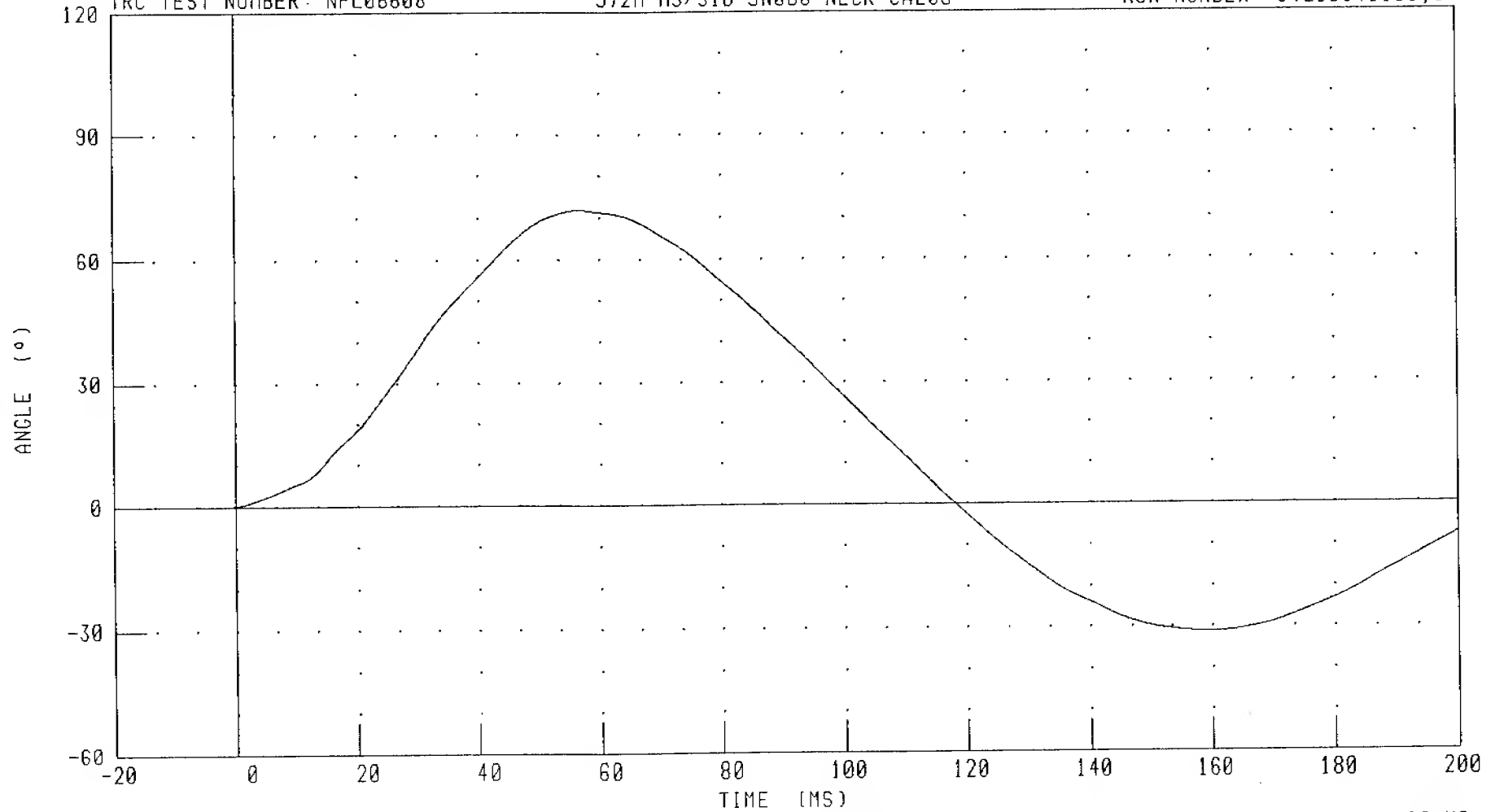
572M H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

TOTAL ROTATION

TRC TEST NUMBER: NFL06608

572M H3/SID SN066 NECK CAL08

RUN NUMBER: 042903.1119;1



CHANNEL: TOTAN FILTER: CH. CLASS 60

PEAK DATA: 71.78 ° @ 56.64 MS; -31.07 ° @ 159.68 MS

C-110

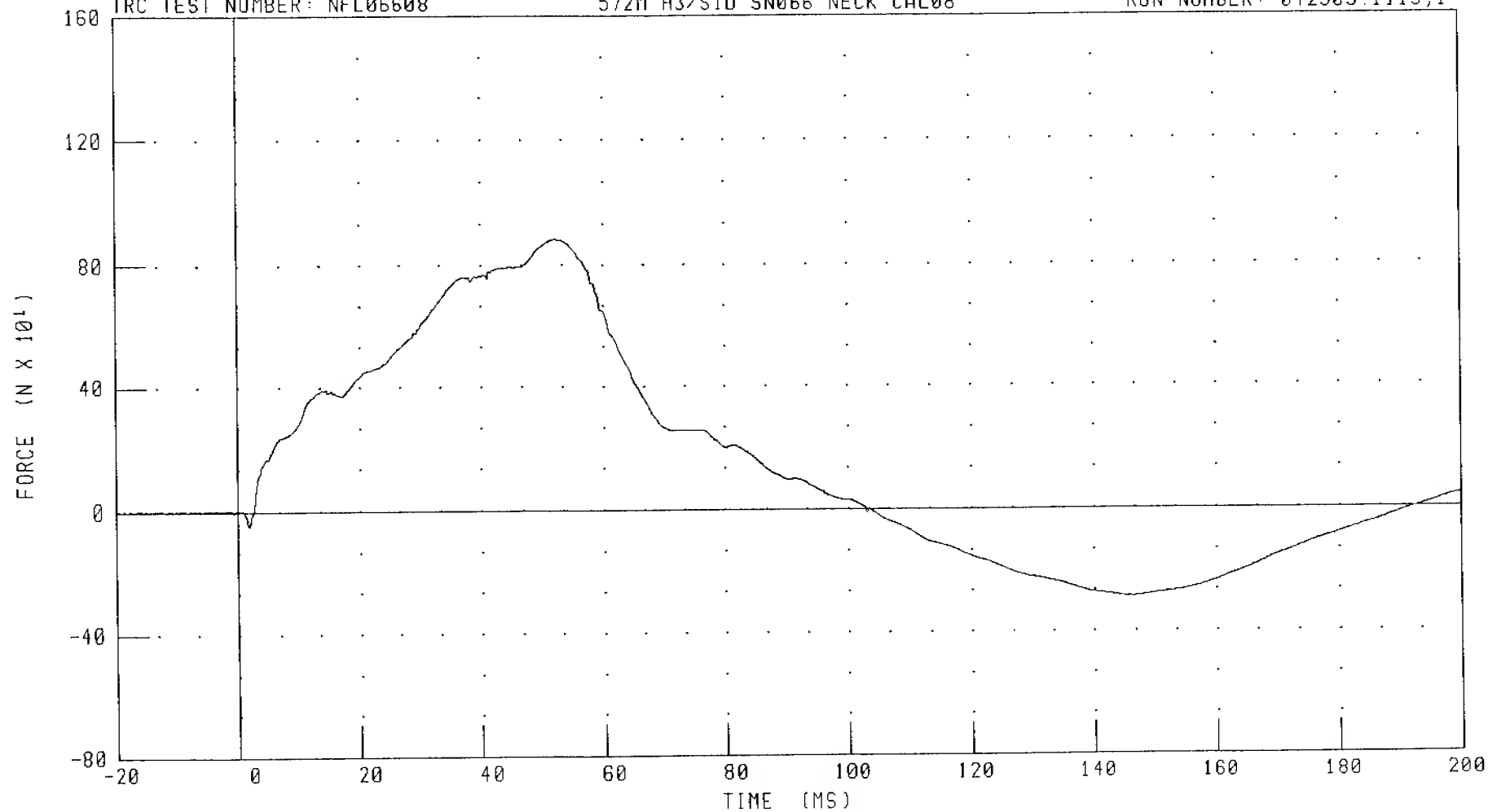
030422-1

572M H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST
NECK FORCE Y AXIS

TRC TEST NUMBER: NFL06608

572M H3/SID SN066 NECK CAL08

RUN NUMBER: 042903.1119;1



CHANNEL: NEKYF FILTER: CH CLASS 1000

030422-1

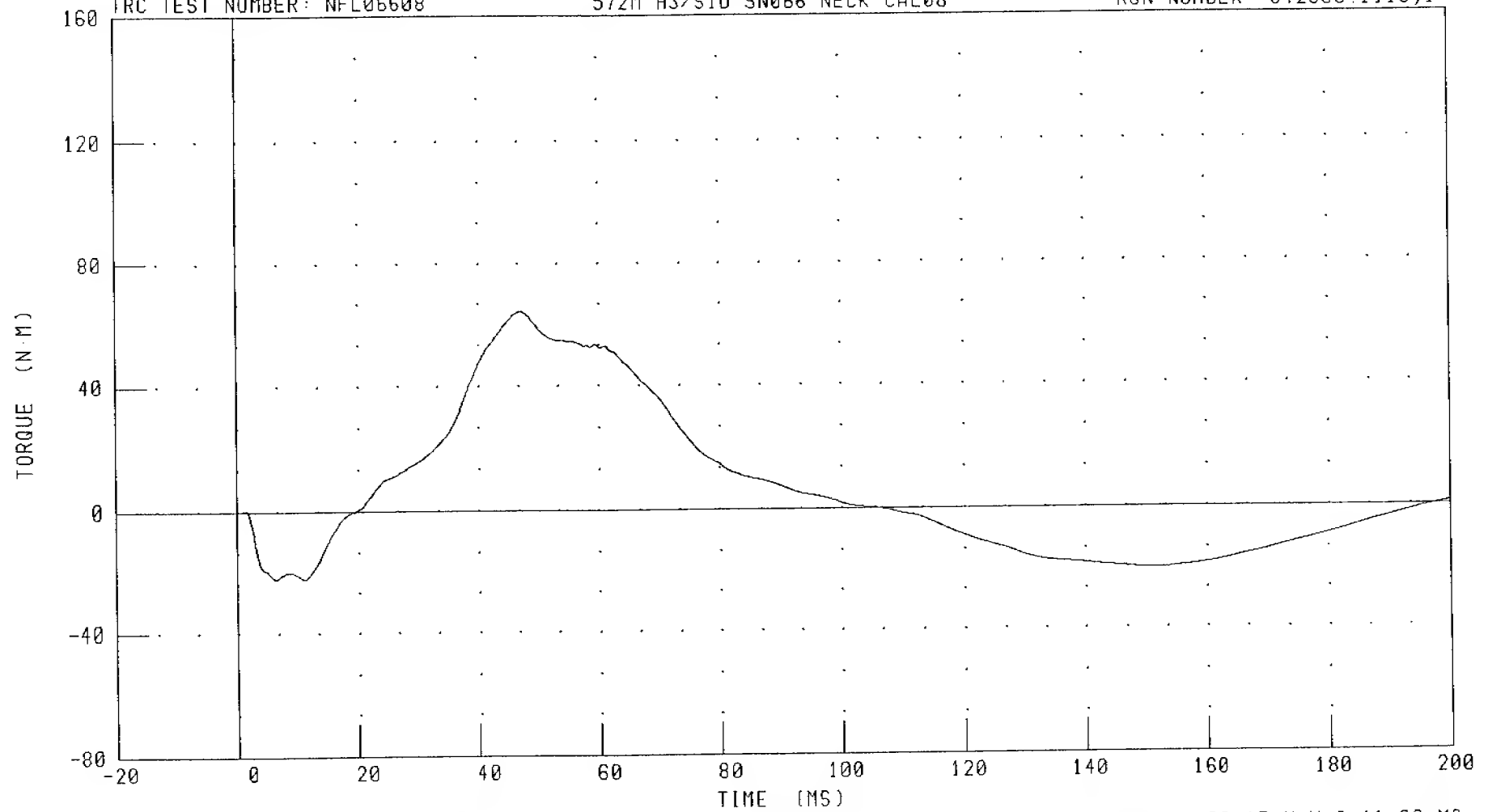
572M H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

NECK MOMENT X AXIS

TRC TEST NUMBER: NFL06608

572M H3/SID SN066 NECK CAL08

RUN NUMBER: 042903.1119;1



CHANNEL: NEKXM

FILTER: CH. CLASS 600

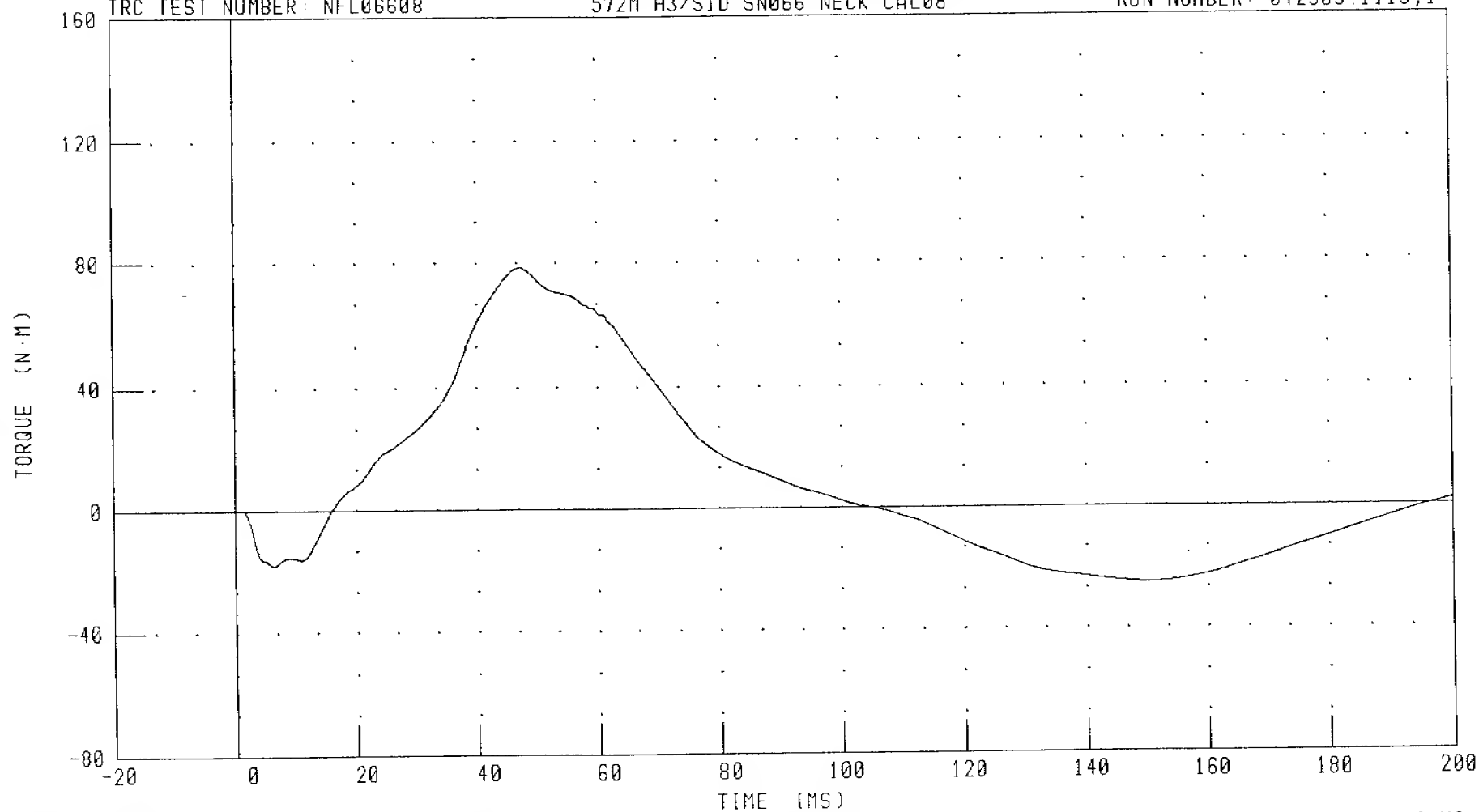
030422-1

572M H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST
TOTAL MOMENT ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: NFL06608

572M H3/SID SN066 NECK CAL08

RUN NUMBER: 042903.1119;1



CHANNEL: NEKOM

FILTER: CH. CLASS 600

030422-1

TRANSPORTATION RESEARCH CENTER INC.

THORACIC SHOCK ABSORBER TESTS

SIDE IMPACT DUMMY

29-APR-03

TRC INC.

572F SN066 DAMPER TEST CAL08

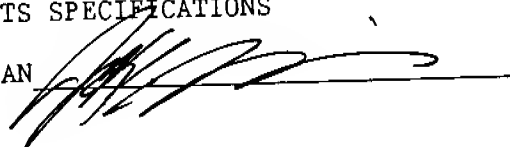
TEST NUMBERS: DP06608A, DP06608B, DP06608C

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		18.9 - 25.5 C	21.7 DEG. C
RELATIVE HUMIDITY		10 - 70 %	34.0 %
VELOCITY	FORCE	683 - 944 N	847 N
	DISPLACEMENT	29.8 - 34.6 MM	30.4 MM
2.76 M/S	VELOCITY	1733 - 2100 N	1989 N
	DISPLACEMENT	31.6 - 37.2 MM	34.1 MM
4.26 M/S	FORCE	3743 - 4448 N	4118 N
	DISPLACEMENT	33.3 - 39.5 MM	39.0 MM
6.10 M/S	VELOCITY		
	DISPLACEMENT		

DAMPER SETTING = 5.0

TEST MEETS SPECIFICATIONS

TECHNICIAN



RUN NUMBER: 042903.1056;1

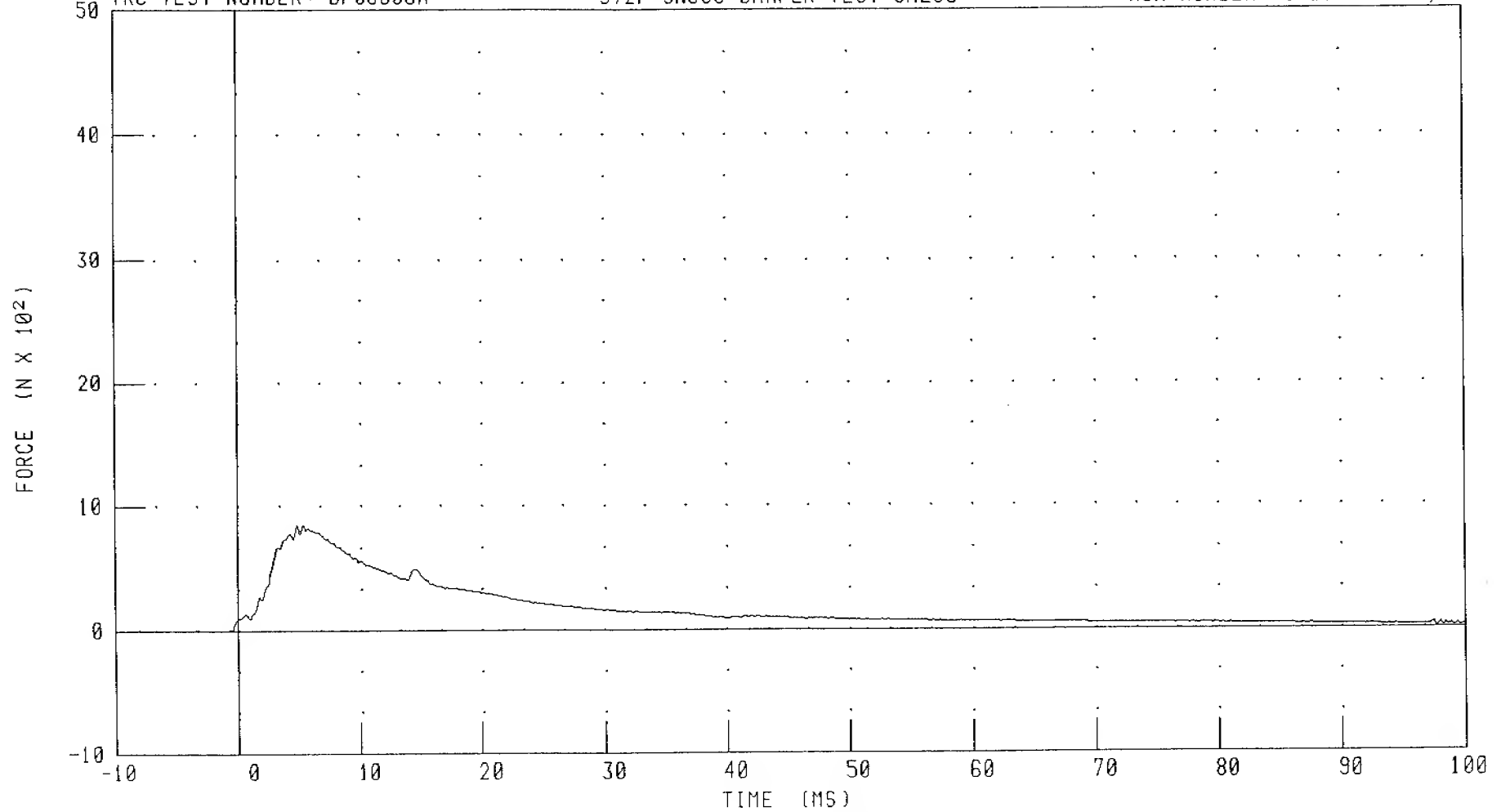
PART 572-F S I D THORACIC SHOCK ABSORBER CALIBRATION (3.0 M/SEC)

SHOCK ABSORBER RESISTIVE FORCE

TRC TEST NUMBER: DP06608A

572F SN066 DAMPER TEST CAL08

RUN NUMBER: 042903.1056;1



CHANNEL: DAMPF FILTER: CH. CLASS 1000

PEAK DATA: 847.34 N @ 4.80 MS; -2.01 N @ -3.76 MS

C-115

030422-1

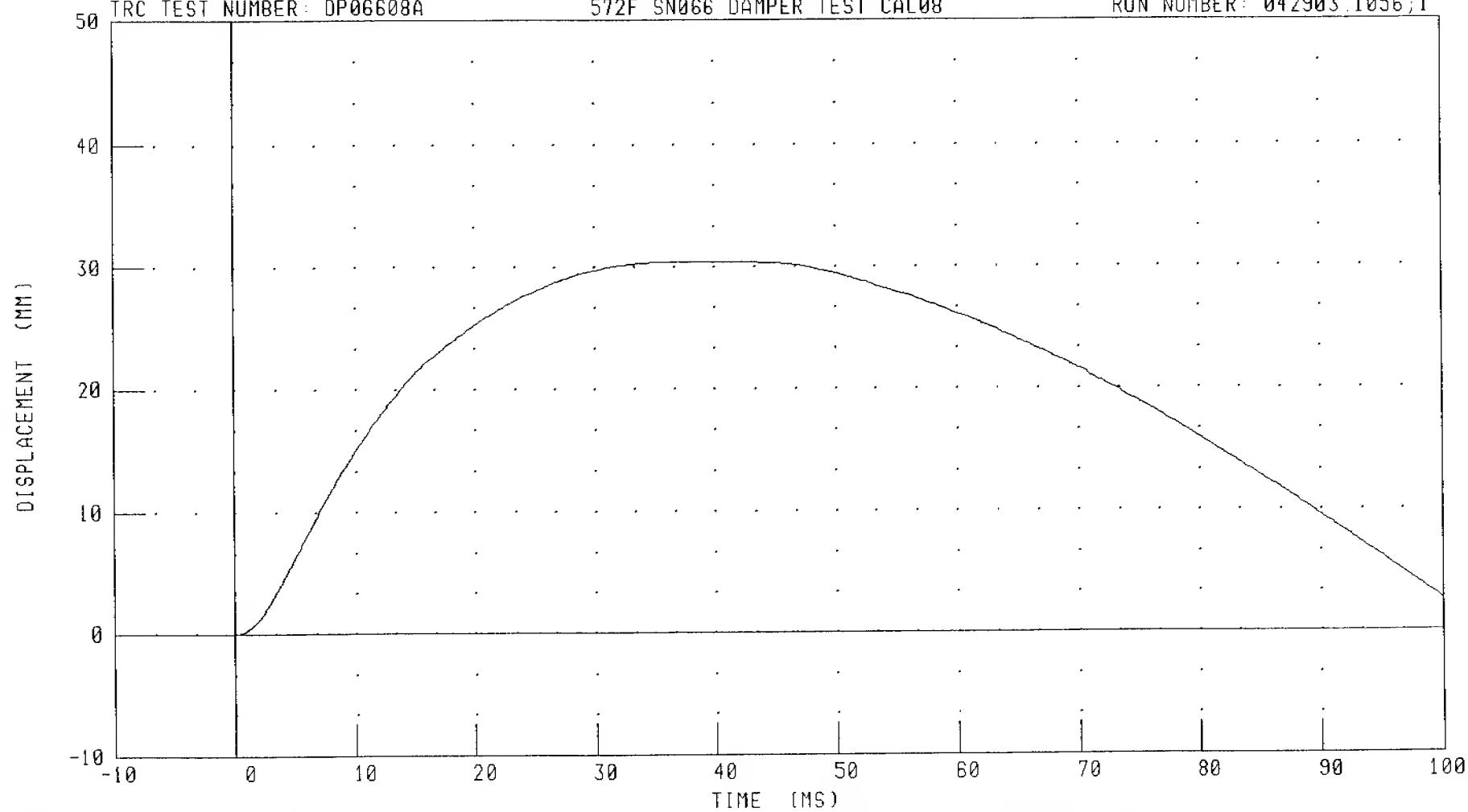
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (3.0 M/SEC)

SHOCK ABSORBER DISPLACEMENT

TRC TEST NUMBER: DP06608A

572F SN066 DAMPER TEST CAL08

RUN NUMBER: 042903.1056;1



CHANNEL: CSTYD FILTER: CH CLASS 1000

PEAK DATA: 30.39 MM @ 36.72 MS; 0.00 MM @ -9.68 MS

030422-1

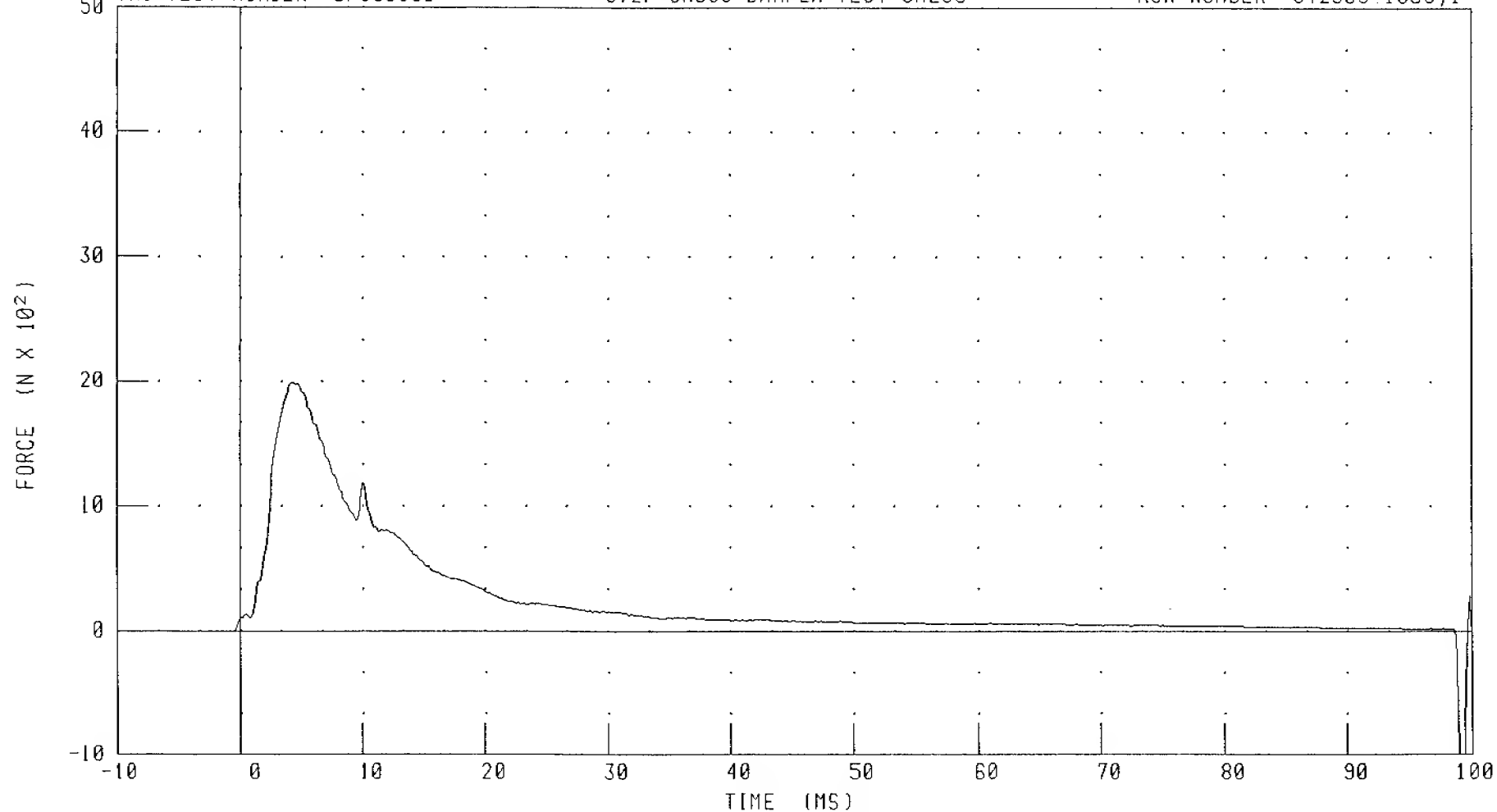
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (4.3 M/SEC)

SHOCK ABSORBER RESISTIVE FORCE

TRC TEST NUMBER: DP06608B

572F SN066 DAMPER TEST CAL08

RUN NUMBER: 042903.1056;1



CHANNEL: DAMPF

FILTER: CH. CLASS 1000

030422-1

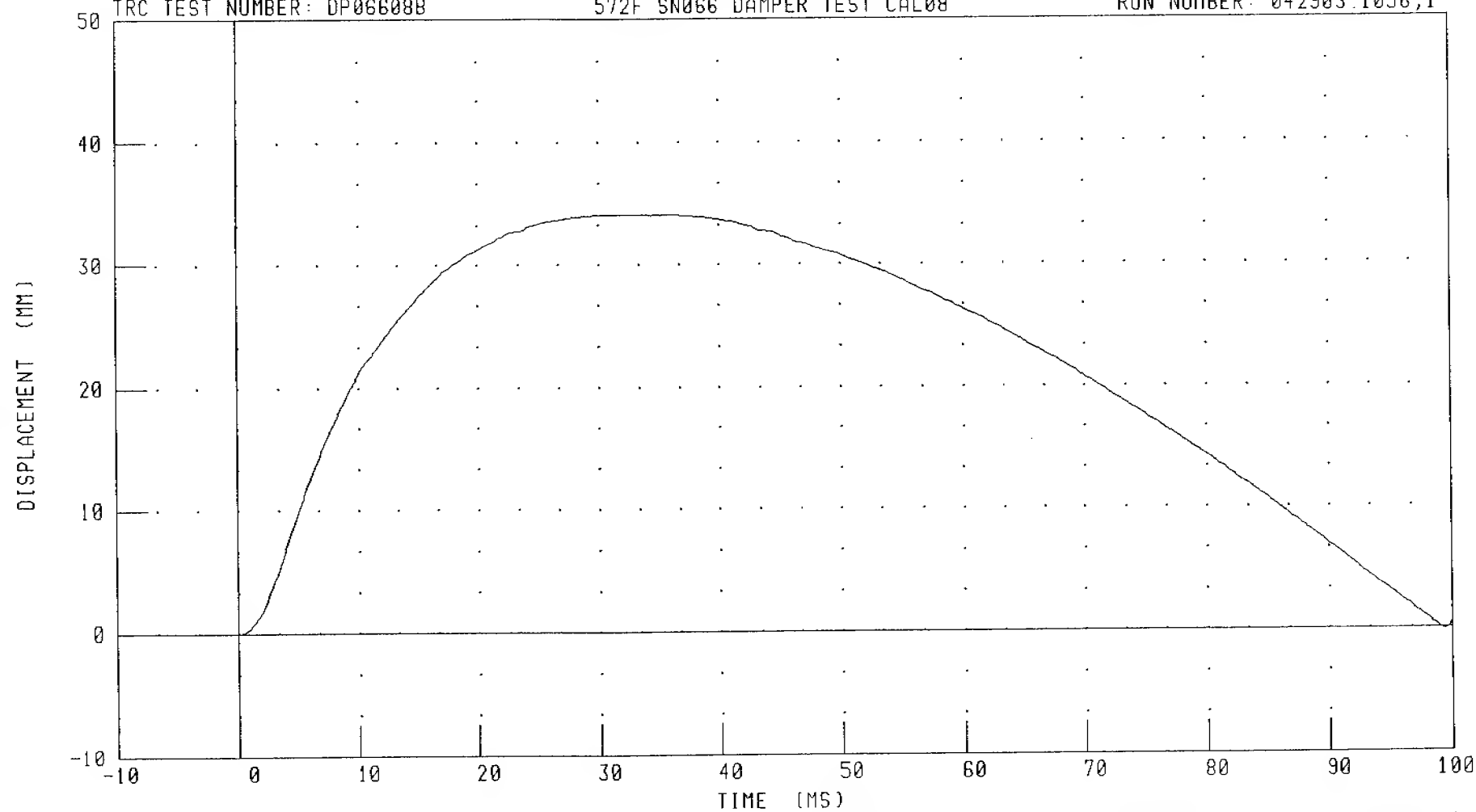
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (4.3 M/SEC)

SHOCK ABSORBER DISPLACEMENT

TRC TEST NUMBER: DP06608B

572F SN066 DAMPER TEST CAL08

RUN NUMBER: 042903.1056;1



CHANNEL: CSTYD

FILTER: CH. CLASS 1000

PEAK DATA: 34.09 MM @ 30.08 MS; -0.15 MM @ 99.36 MS

030422-1

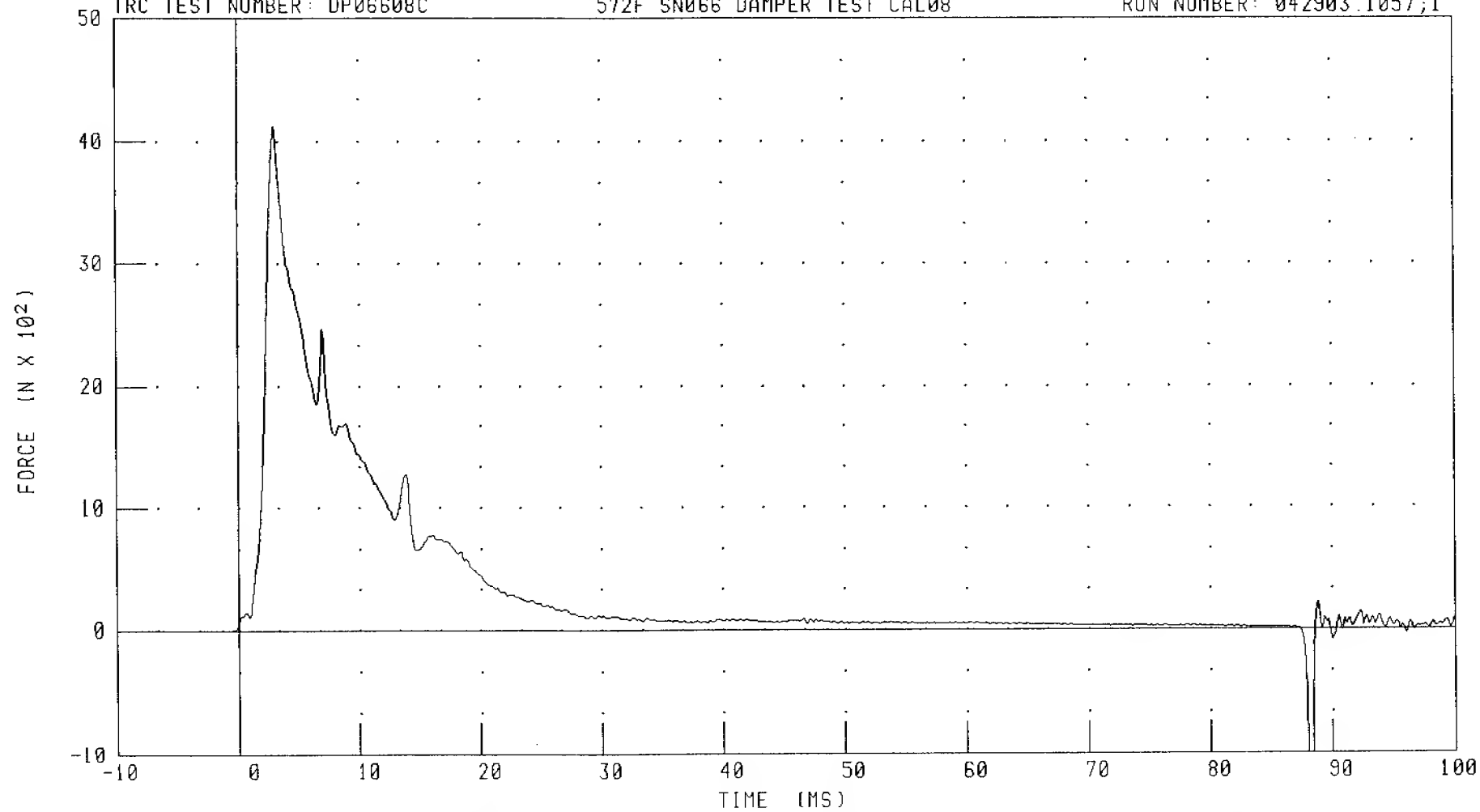
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (6.1 M/SEC)

SHOCK ABSORBER RESISTIVE FORCE

TRC TEST NUMBER: DP06608C

572F SN066 DAMPER TEST CAL08

RUN NUMBER: 042903.1057;1



CHANNEL: DAMPF

FILTER: CH. CLASS 1000

030422-1

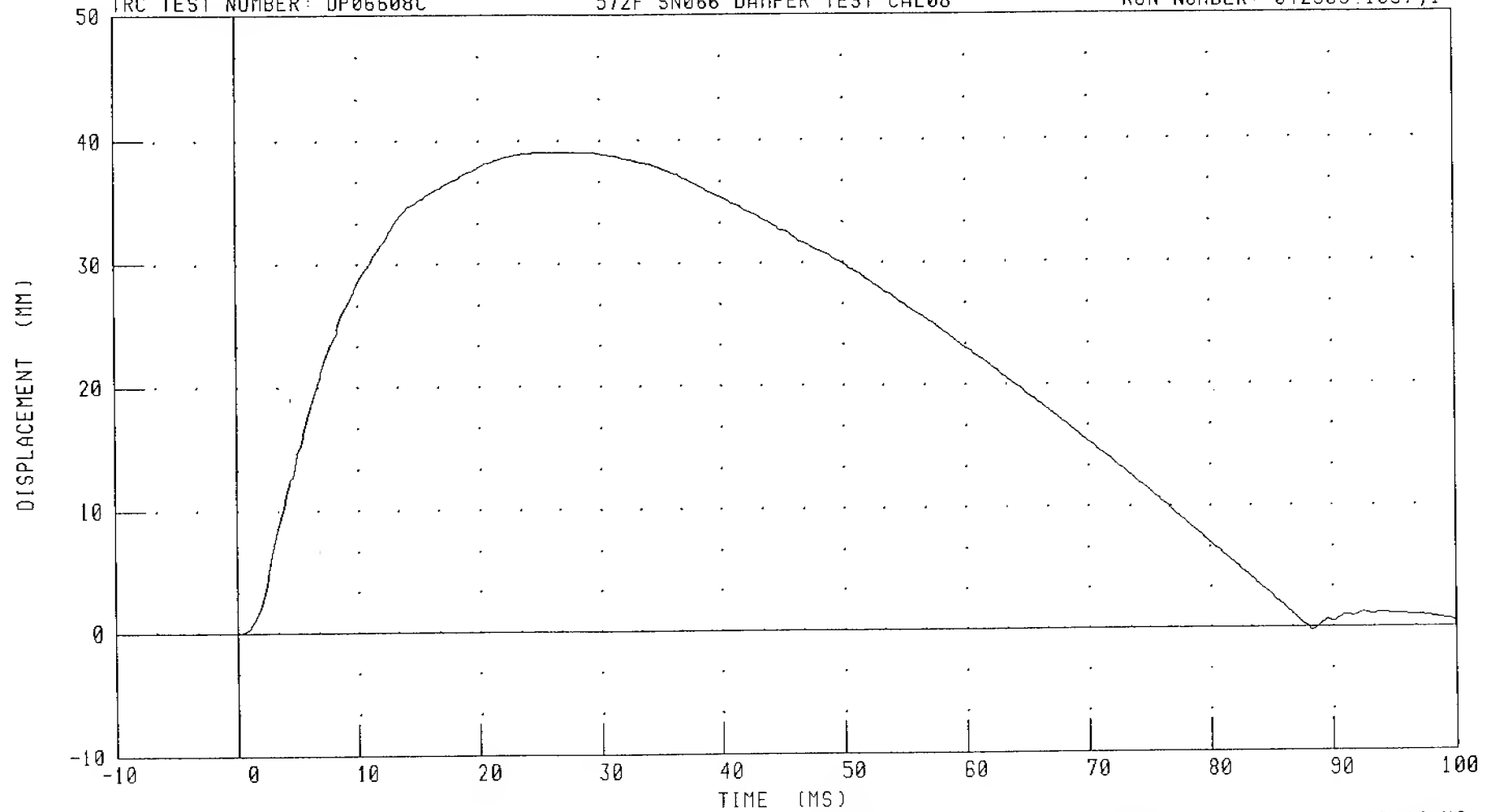
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (6.1 M/SEC)

SHOCK ABSORBER DISPLACEMENT

TRC TEST NUMBER: DP06608C

572F SN066 DAMPER TEST CAL08

RUN NUMBER: 042903.1057;1



CHANNEL: CSTYD FILTER: CH. CLASS 1000

PEAK DATA: 39.02 MM @ 28.32 MS; -0.27 MM @ 88.40 MS

030422-1

TRANSPORTATION RESEARCH CENTER INC.

LATERAL THORAX IMPACT TEST

SIDE IMPACT DUMMY

28-APR-03

LEFT SIDE CONFIGURATION

TRC INC.

TEST NO: STL06608A

572F SID SN066 L.THORAX CAL08

TEST PARAMETER	SPECIFICATION (ABSOLUTE VALUE)	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	26.0 %
PENDULUM VELOCITY	4.21 - 4.33 M/S	4.23 M/S
PEAK ACCELERATION: UPPER RIB BAR	37 - 46 G	41.0 G
PEAK ACCELERATION: LOWER RIB BAR	37 - 46 G	40.2 G
PEAK ACCELERATION: LOWER THORACIC SPINE	15 - 22 G	19.2 G

TEST MEETS SPECIFICATIONS

TECHNICIAN



RUN NUMBER: 042803.0921;1

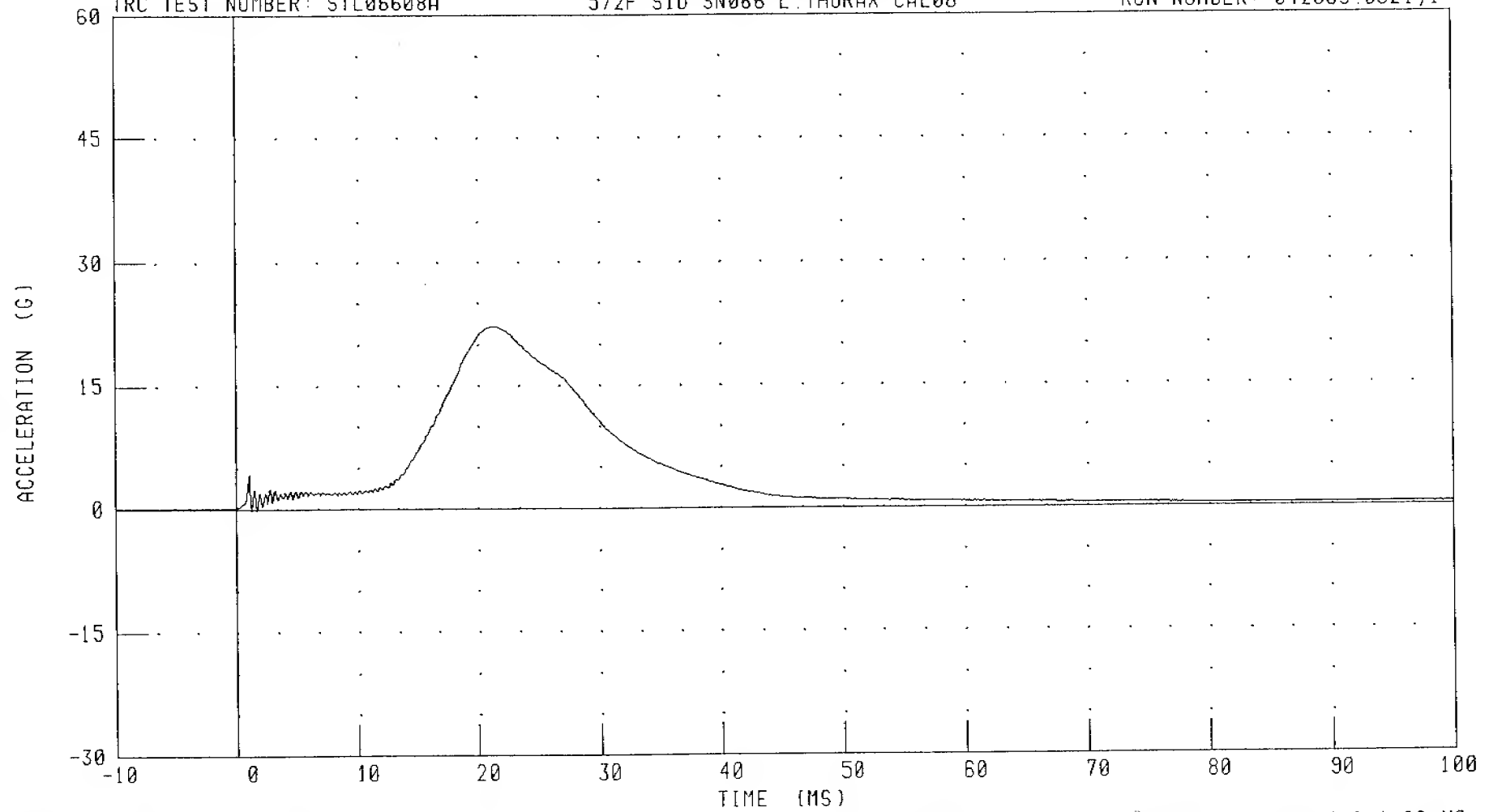
PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)

PENDULUM DECELERATION

TRC TEST NUMBER: STL06608A

572F SID SN066 L THORAX CAL08

RUN NUMBER: 042803.0921;1



CHANNEL: PENXC

FILTER: CH CLASS 1000

PEAK DATA: 22.22 G @ 21.20 MS; -0.22 G @ 1.68 MS

030422-1

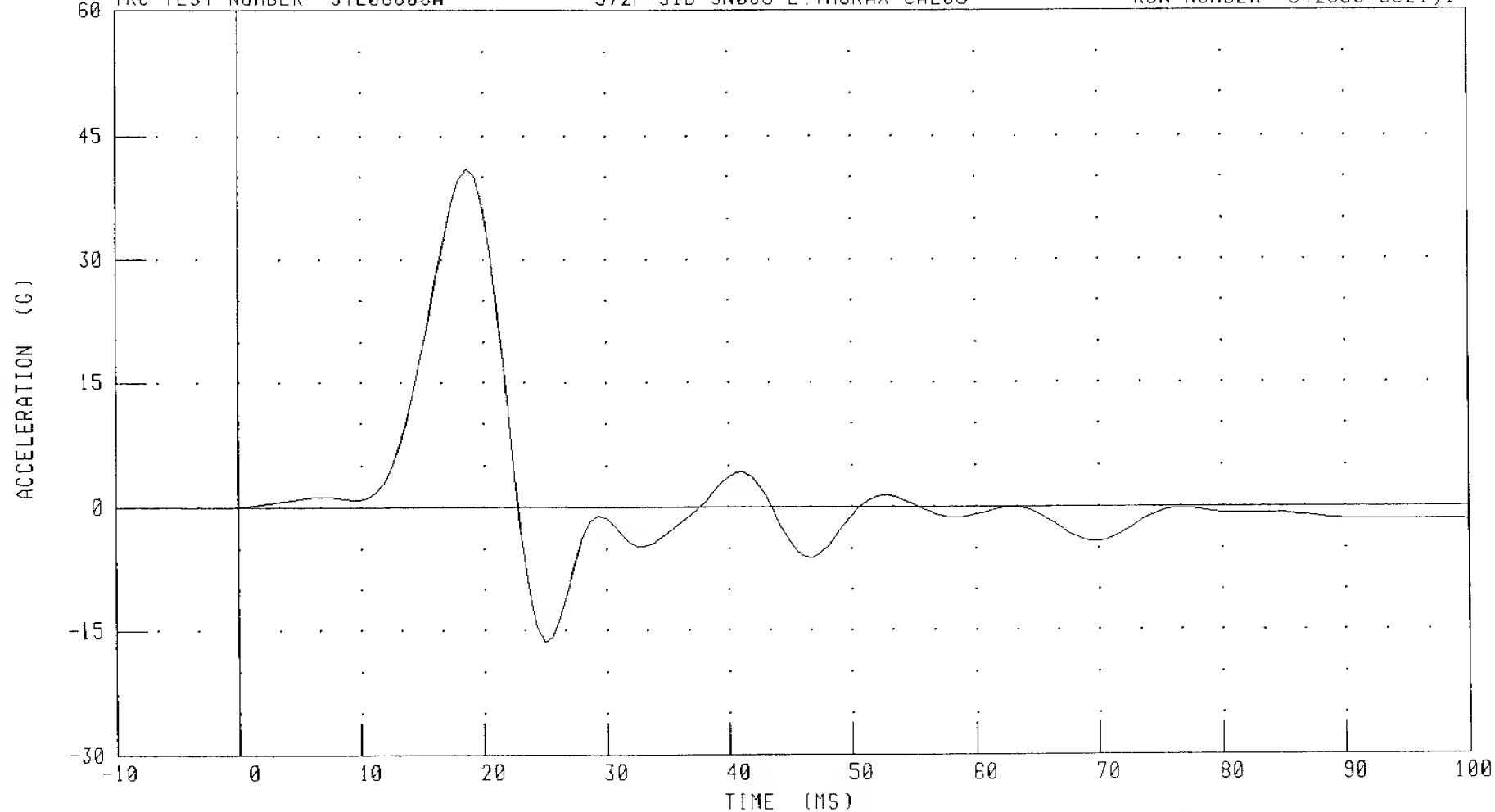
PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)

LEFT UPPER RIB ACCELERATION Y AXIS

TRC TEST NUMBER: STL06608A

572F SID SN066 L THORAX CAL08

RUN NUMBER: 042803.0921;1



CHANNEL: LURYG

FILTER: FIR 100

PEAK DATA: 40.99 G @ 18.75 MS; -16.42 G @ 25.00 MS

C-123

030422-1

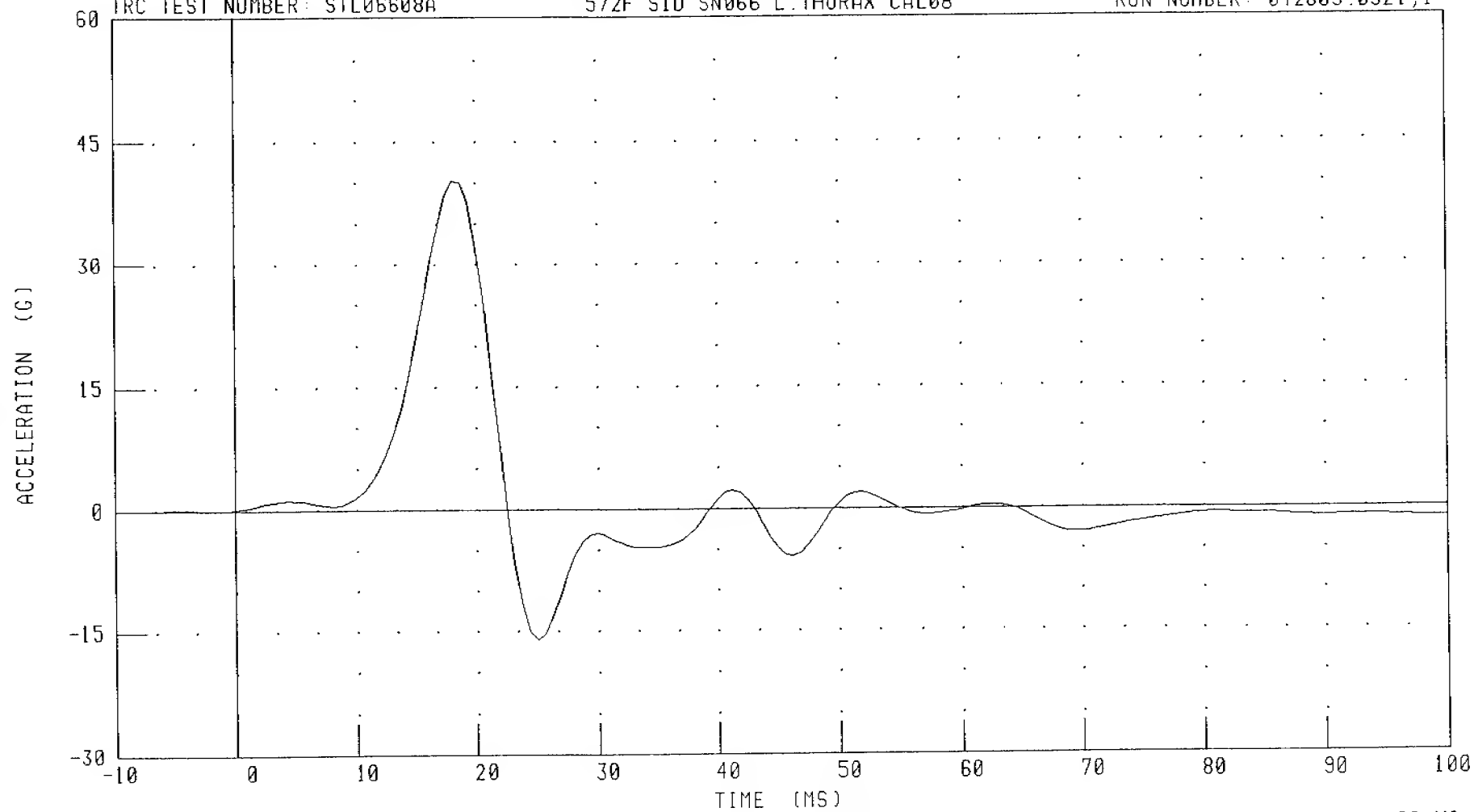
PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)

LEFT LOWER RIB ACCELERATION Y AXIS

TRC TEST NUMBER: STL06608A

572F SID SN066 L THORAX CAL08

RUN NUMBER: 042803.0921;1



030422-1

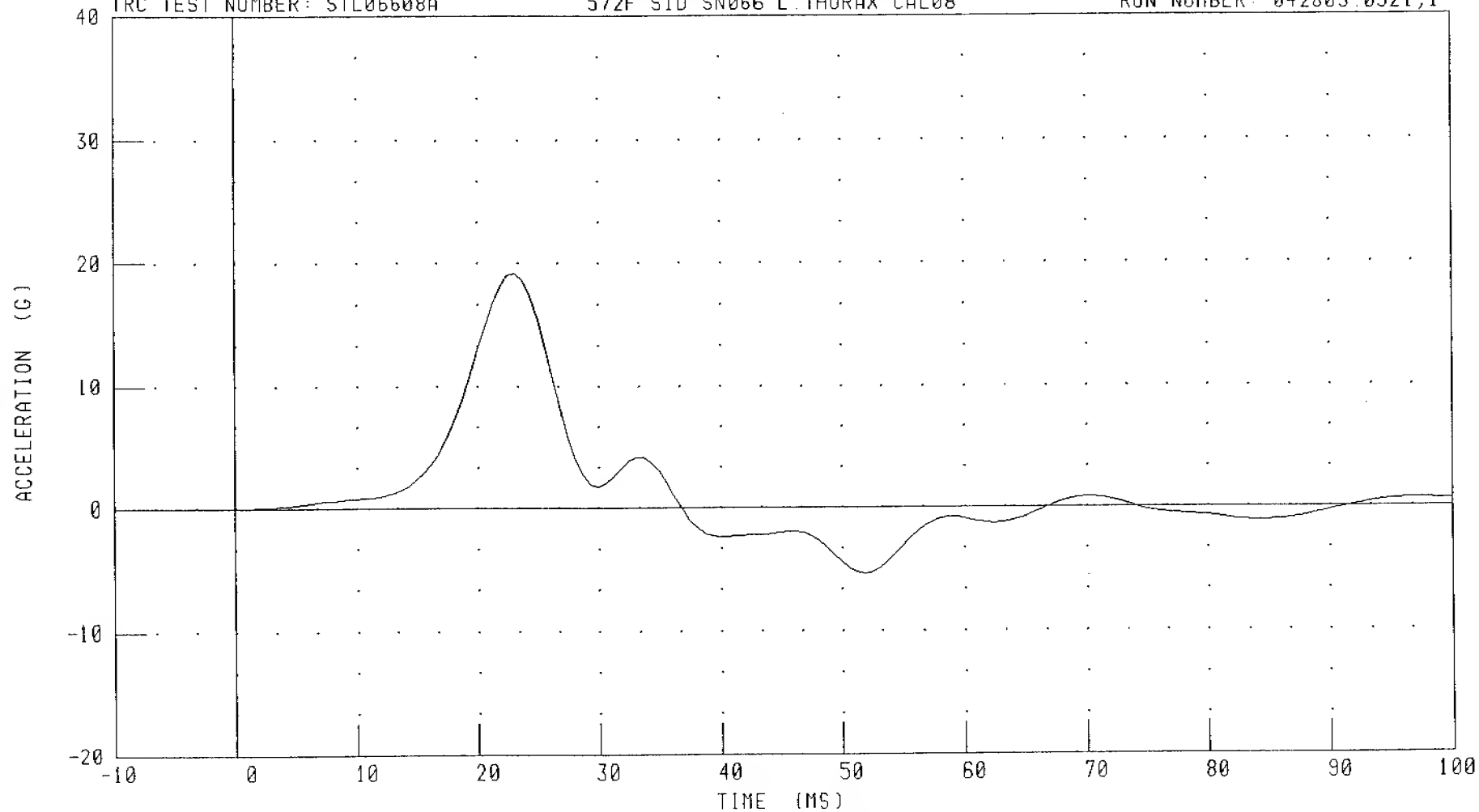
PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)

LOWER SPINE ACCELERATION Y AXIS

TRC TEST NUMBER: STL06600A

572F SID SN066 L THORAX CAL08

RUN NUMBER: 042803.0921;1



CHANNEL: T12YG

FILTER: FIR 100

PEAK DATA: 19.18 G @ 23.13 MS; -5.45 G @ 51.88 MS

C-125

030422-1

Transportation Research Center Inc.

572B Abdomen Compression Test

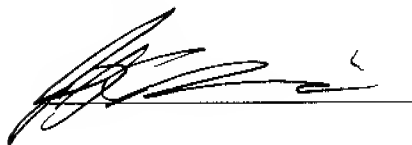
HIII SID Serial No. 066 Calibration No. 08 - 1

Test Date 04/29/2003

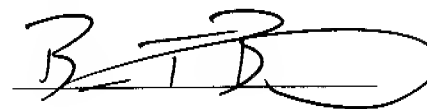
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	35 %	Yes
Displacement Rate	6.35 - 8.89 mm/s	7.2 - 8.0 mm/s	Yes
Data Within Required Corridor	Yes	Yes	Yes

Comments:

Technician



Approved



04.29.2003 11:27:03 2

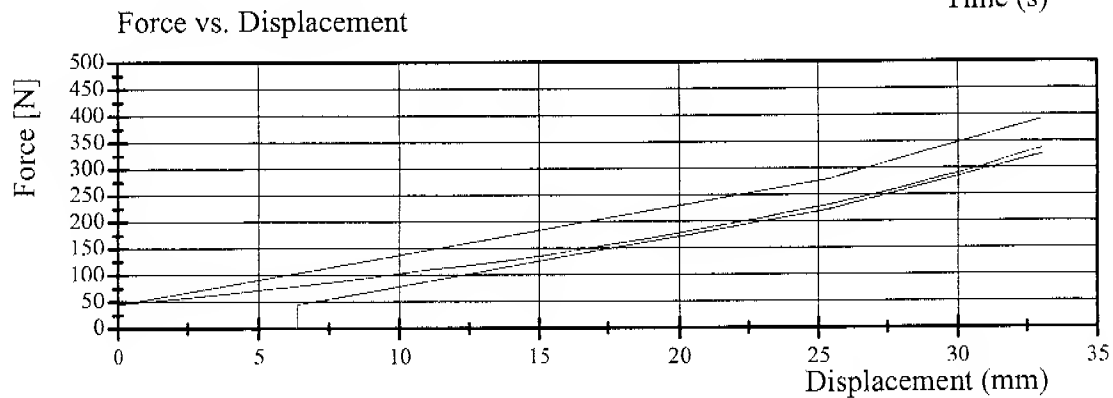
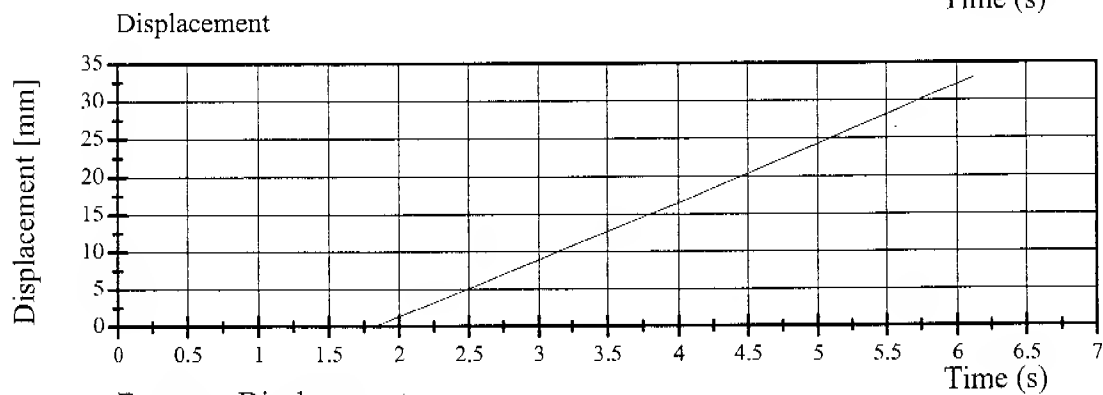
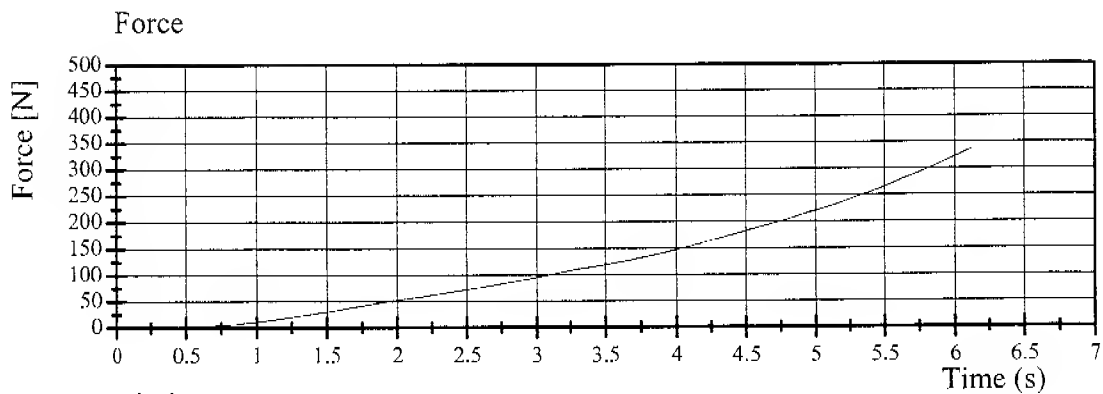


Transportation Research Center Inc.

572B Abdomen Compression Test

HIH SID Serial No. 066 Calibration No. 08 - 1

Test Date 04/29/2003



04.29.2003 11:27:03 2



TRANSPORTATION RESEARCH CENTER INC.

LUMBAR FLEXION TEST

SID PART 572B

CAL DATE: 29-Apr-03

TRC, INC.

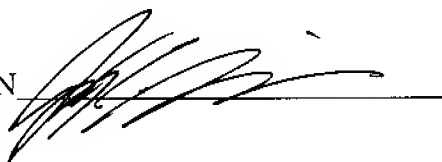
TEST NO: 066C08TF1

572B SN 066 TORSO FLEX CAL 08

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 – 25.6° C	21.7 °C
RELATIVE HUMIDITY	10 – 70 %	37 %
FORCE AT 0 DEG. FLEXION	-27 – 27 N	0 N
FORCE AT 20 DEG OF FLEXION	98 – 151 N	106.8 N
FORCE AT 30 DEG OF FLEXION	151 – 205 N	160.1 N
FORCE AT 40 DEG OF FLEXION	205 – 258 N	222.4 N
NET RETURN ANGLE AFTER 3 MINUTES	< 12 °	5 °

TEST MEETS SPECIFICATIONS

TECHNICIAN



TRANSPORTATION RESEARCH CENTER INC.

LATERAL PELVIS IMPACT TEST

SIDE IMPACT DUMMY

28-APR-03

LEFT SIDE CONFIGURATION

TRC INC.

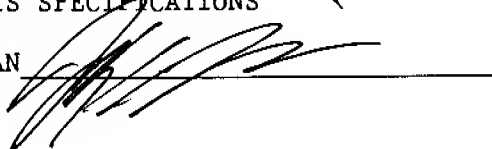
TEST NO: SPL06608

572F SN066 LEFT PELVIS CAL08

TEST PARAMETER	SPECIFICATION (ABSOLUTE VALUE)	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	26.0 %
PENDULUM VELOCITY	4.21 - 4.33 M/S	4.28 M/S
PEAK PELVIC ACCELERATION	40 - 60 G	53.7 G
TIME ABOVE 20 G LEVEL	3 - 7 MS	6.0 MS
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN



RUN NUMBER: 042803.0927;1

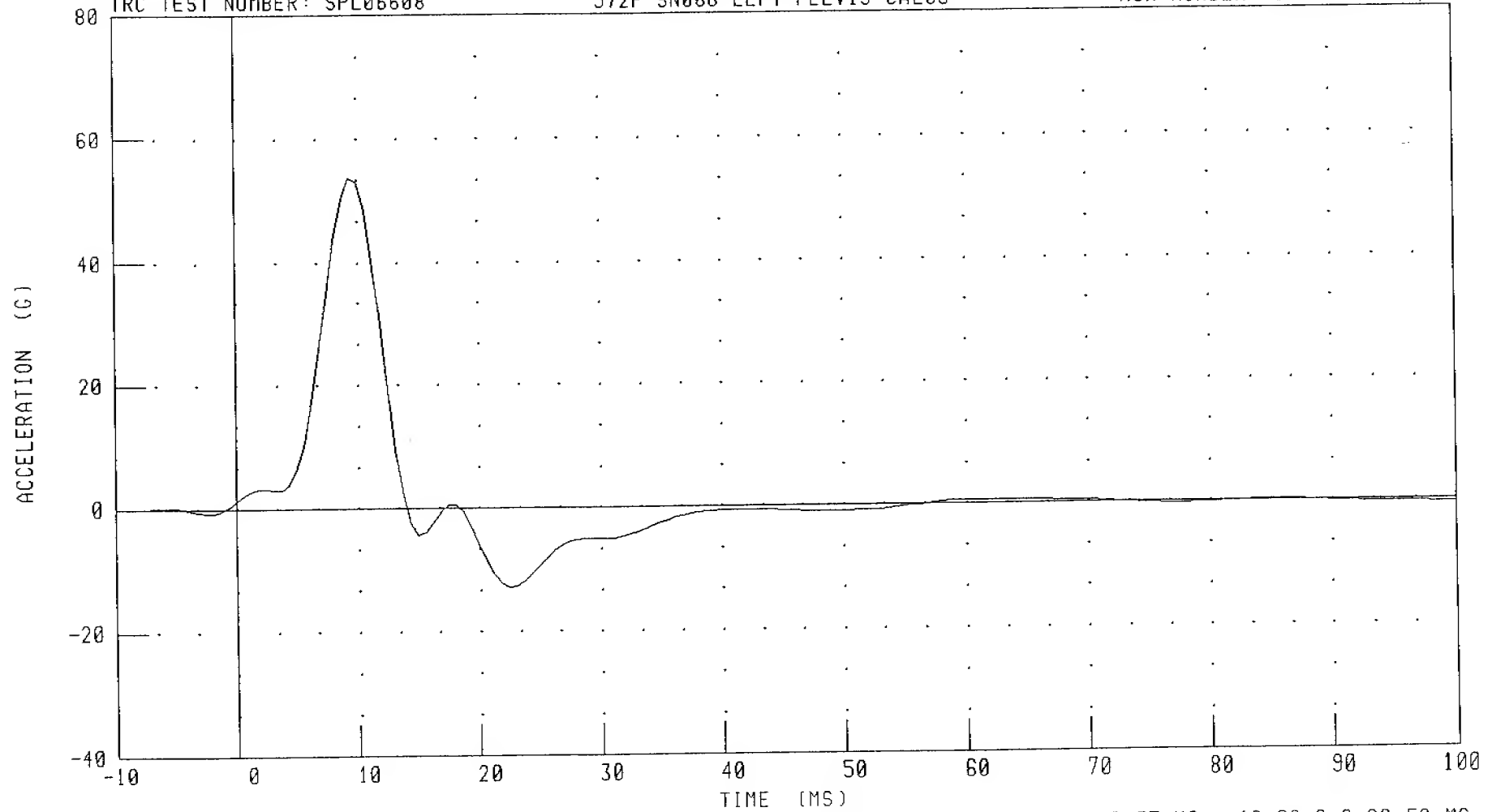
PART 572-F S.I.D. PELVIS CALIBRATION - (LEFT SIDE IMPACT)

PELVIS ACCELERATION Y AXIS

TRC TEST NUMBER: SPL06608

572F SN066 LEFT PELVIS CAL08

RUN NUMBER: 042803.0927,1



CHANNEL: PEVYG

FILTER: FIR 100

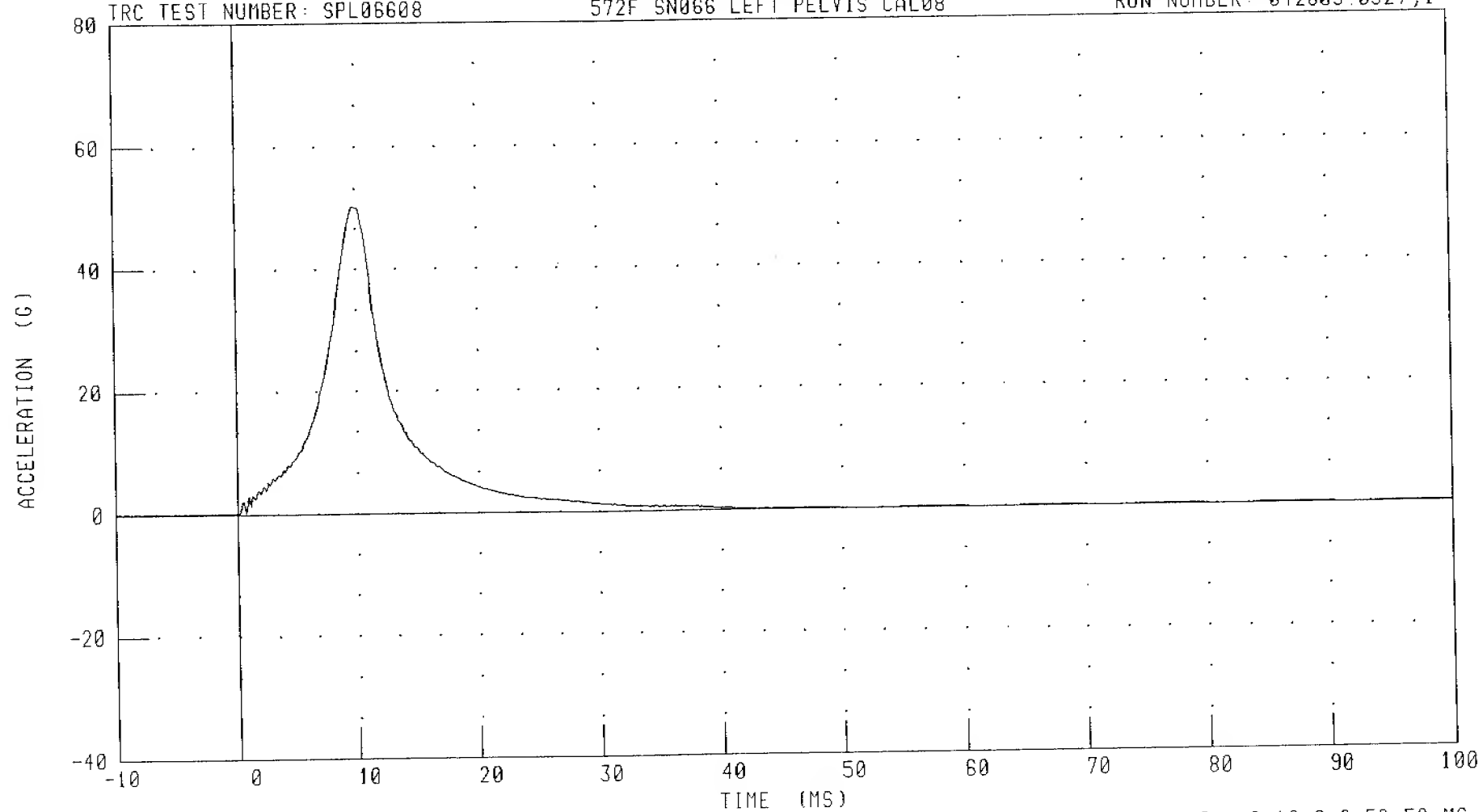
030422-1

PART 572-F S.I.D. PELVIS CALIBRATION - (LEFT SIDE IMPACT)
PENDULUM DECELERATION

TRC TEST NUMBER: SPL06608

572F SN066 LEFT PELVIS CAL08

RUN NUMBER: 042803.0927;1



CHANNEL: PENXG

FILTER: CH CLASS 1000

PEAK DATA: 50.28 G @ 9.92 MS; -0.12 G @ 52.56 MS

030422-1

Transportation Research Center Inc.

SID Pre-Use Inspection

Type: HIII SID S/N: 066 Mfr: Denton Test Date: 04/22/03

Proj./Seg. No.: 20020455-1140 Test Eng.: Ginny Watters

ITEM	PRE-USE	
HEAD:		
Head Ballast Condition	X	
Accel. Mount Bolts and Cables	X	
Skull Cap Bolts	X	
Head Skin Condition	X	
Accel. Cable Exit (left or right)	(Left)	(Right) N/A
NECK:		
Rubber Condition and Separation From End Caps	X	
THORAX:		
Stacked Shoulder Foams and Bolts	X	
* Rib Cage Spring and Support Assembly	X	
* Rib Cage Bolts	X	
* Damper Rear Attachment Ring, Pivot Pins, and Bracket	X	
* Location and Adjustment of Chest Pot Bracket and Collars	X	
* Chest Pot Rod End Nuts and Eyebolt	X	
Arm Foam Orientation	X	
Thorax/Lumbar Spine Bolts	X	
PELVIS:		
Tightness and Alignment of H-Point Tool Insert	X	
* Hips Range of Motion and 1-2g Adjustment (before calibration only)	X	
Upper Femur Bolt Adjustment and Position	X	
Check Spine Kits (Yellow tape = Kits/No tape = No kits)	(With) X	(Without)
LEGS AND FEET:		
Femur Load Cell Bolts (40 ft/lbs)	X	
Breakaway Femur Bolts (5-6 ft/lbs)	X	
Knee Joint Function and Range of Motion	X	
Leg Skin Condition and Position	X	
Ankle Range of Motion	X	
Foot Condition	X	
OTHER:		
Cleanliness	X	
Target Position	X	
Clothes	X	
Shoes	X	
Knee & Ankle One G Joint Adjustments	X	

Inspection Completed By: J. Clarridge

Date: 04/14/03

Transportation Research Center Inc.

SID Pre-Use Inspection

Type: HIH SID S/N: 065 Mfr: Denton Test Date: 04/22/03Proj./Seg. No.: 20020455-1140 Test Eng.: Ginny Watters

ITEM	PRE-USE	
HEAD:		
Head Ballast Condition	X	
Accel. Mount Bolts and Cables	X	
Skull Cap Bolts	X	
Head Skin Condition	X	
Accel. Cable Exit (left or right)	(Left)	(Right) N/A
NECK:		
Rubber Condition and Separation From End Caps	X	
THORAX:		
Stacked Shoulder Foams and Bolts	X	
* Rib Cage Spring and Support Assembly	X	
* Rib Cage Bolts	X	
* Damper Rear Attachment Ring, Pivot Pins, and Bracket	X	
* Location and Adjustment of Chest Pot Bracket and Collars	X	
* Chest Pot Rod End Nuts and Eyebolt	X	
Arm Foam Orientation	X	
Thorax/Lumbar Spine Bolts	X	
PELVIS:		
Tightness and Alignment of H-Point Tool Insert	X	
* Hips Range of Motion and 1-2g Adjustment (before calibration only)	X	
Upper Femur Bolt Adjustment and Position	X	
Check Spine Kits (Yellow tape = Kits/No tape = No kits)	(With) X	(Without)
LEGS AND FEET:		
Femur Load Cell Bolts (40 ft/lbs)	X	
Breakaway Femur Bolts (5-6 ft/lbs)	X	
Knee Joint Function and Range of Motion	X	
Leg Skin Condition and Position	X	
Ankle Range of Motion	X	
Foot Condition	X	
OTHER:		
Cleanliness	X	
Target Position	X	
Clothes	X	
Shoes	X	
Knee & Ankle One G Joint Adjustments	X	

Inspection Completed By: J. Clarridge Date: 04/21/03

Transportation Research Center Inc.

SID Post-Use Inspection

Type: HIII SID S/N: 066 Mfr: Denton Test Date: 04/22/03

Proj./Seg. No.: 20020455-1140 Test Eng.: Ginny Watters

ITEM	POST-USE
HEAD:	
Head Skin Condition	X
Head Ballast Condition	X
NECK:	
Rubber Condition and Separation From End Caps	X
THORAX:	
Jacket Condition	X
Arm Foam Condition	X
Damper and Movement and Condition	X
Rib Cage Spring and Support Assembly Condition	X
Rib Wrap Condition	X
Abdomen condition	X
Thorax/Lumbar Spine Bolts	X
Lumbar Spine Condition and Separation From End Caps	X
PELVIS:	
Iliac Crest bone	X
Flesh Condition	X
Hip Range of Motion	X
LEGS AND FEET:	
Knee Skins and Castings Condition	X
Leg Skin Condition	X
Foot Condition	X
Knee Joint Range of Motion	X
Ankle Range of Motion	X

NOTES: No damage to report.

Inspection Completed By: J. Clarridge

Date: 04/23/03

Transportation Research Center Inc.

SID Post-Use Inspection

Type: HIH SID S/N: 065 Mfr: Denton Test Date: 04/22/03

Proj./Seg. No.: 20020455-1140 Test Eng.: Ginny Watters

ITEM	POST-USE
HEAD:	
Head Skin Condition	X
Head Ballast Condition	X
NECK:	
Rubber Condition and Separation From End Caps	X
THORAX:	
Jacket Condition	X
Arm Foam Condition	X
Damper and Movement and Condition	X
Rib Cage Spring and Support Assembly Condition	X
Rib Wrap Condition	X
Abdomen condition	X
Thorax/Lumbar Spine Bolts	X
Lumbar Spine Condition and Separation From End Caps	X
PELVIS:	
Iliac Crest bone	X
Flesh Condition	X
Hip Range of Motion	X
LEGS AND FEET:	
Knee Skins and Castings Condition	X
Leg Skin Condition	X
Foot Condition	X
Knee Joint Range of Motion	X
Ankle Range of Motion	X

NOTES: No damage to report.

Inspection Completed By: J. Clarridge

Date: 04/23/03

Appendix D

Test Equipment List and Calibration Information

Sign Convention
SAE J211 MAR95

Accelerometers: +X: Forward
 +Y: Rightward
 +Z: Downward

<u>Potentiometers:</u>	+Chest longitudinal deflection:	Outward
	+Chest lateral deflection:	Rightward
	+Seat belt displacement:	Outward
	+Seat belt extension:	Elongation
	+Knee slider displacement:	Distance between femur and tibia increased (in relation to a seated dummy)

Rotation potentiometers:

+About the X-axis:	Left foot-eversion
	Right foot-inversion
+About the Y-axis:	Left/right foot-dorsiflexion
+About the Z-axis:	Left foot-internal
	Right foot-external

<u>Load cells:</u>	+Femur force:	Tension
	+Seat belt force:	Tension
	+Barrier force:	Tension

Neck load cells:

+X force:	Head pushed rearward
+Y force:	Head pushed leftward
+Z force:	Head pulled upward (tension on neck)
+X moment:	Left ear rotating toward left shoulder
+Y moment:	Chin rotating toward chest
+Z moment:	Chin rotating toward left shoulder

Tibia load cells:

+X force:	Ankle forward, knee rearward
+Y force:	Ankle rightward, knee leftward
+Z force:	Tension
+X moment:	Bottom of tibia moving leftward
+Y moment:	Bottom of tibia moving rearward

Sign Convention, Cont'd.
SAE J211 MAR95

Lumbar load cells:

+X force:	Chest rearward, pelvis forward
+Y force:	Chest leftward, pelvis rightward
+Z force:	Chest upward, pelvis downward
+X moment:	Left shoulder toward left hip
+Y moment:	Sternum toward front of legs
+Z moment:	Right shoulder forward, left shoulder rearward

Frequency Response Classes
SAE J211 MAR95

<u>Typical Test Measurements</u>	<u>Channel Class</u>
Vehicle Structural Accelerations for use in:	
Total vehicle comparison	60
Collision simulation input	60
Component analysis	600
Integration for velocity or displacement	180
Barrier Face Forces	60
Belt Restraint System Loads	60
Anthropomorphic Test Device	
Head accelerations (linear and angular)	1000
Neck	
Forces	1000
Moments	600
Thorax	
Spine accelerations	180
Rib accelerations	1000
Sternum accelerations	1000
Deflections	600
Lumbar	
Forces	1000
Moments	1000
Pelvis	
Accelerations	1000
Forces	1000
Moments	1000
Femur/Knee/Tibia/Ankle	
Forces	600
Moments	600
Displacements	180
Sled Accelerations	60
Steering Column Loads	600
Head form Accelerations	1000

The direction column on the following sheets describes the transducer output as mounted and wired in the test location. The polarity column indicates whether a polarity change occurred during data acquisition to conform to J211 MAR95. See Report Sign Convention sheet for description of data output as presented in the report: occasionally channels have been adjusted in post-acquisition processing to conform to J211 MAR95.

Channel Report

4/22/2003 8:06:10 AM

Name of Test 030422-1

System MINIDAU

Name of DAU DAU6

Chan.#	Sensor #	Mnemonic	Description	Dir.	Range	Pol.	Cal.	Group	Mfg.	Model
6001	J27271	HEDXG1	Head Accel X	Rwd	800.50031	g	- 3/11/2003	OK 065nlr	Endevco	7264-2000TZ
6002	J27352	HEDYG1	Head Accel Y	Lft	793.42941	g	- 3/11/2003	OK 065nlr	Endevco	7264-2000TZ
6003	J27283	HEDZG1	Head Accel Z	Up	809.34541	g	- 3/11/2003	OK 065nlr	Endevco	7264-2000TZ
6004	J29134	HEDXR1	Head Accel X Red	Rwd	793.89691	g	- 3/11/2003	OK 065nlr	Endevco	7264-2000TZ
6005	J29020	HEDYR1	Head Accel Y Red	Lt	802.35692	g	- 3/11/2003	OK 065nlr	Endevco	7264-2000TZ
6006	J27322	HEDZR1	Head Accel Z Red	Up	814.06811	g	- 3/11/2003	OK 065nlr	Endevco	7264-2000TZ
6007	1716-0627-FX	NEKXF1	Neck Force X	Hd	8900.5691	N	- 3/10/2003	OK 065nlr	Denton	1716
6008	1716-0627-FY	NEKYF1	Neck Force Y	Hd	8904.8480	N	+ 3/10/2003	OK 065nlr	Denton	1716
6009	1716-0627-FZ	NEKZF1	Neck Force Z	Hd	13361.202	N	+ 3/10/2003	OK 065nlr	Denton	1716
6010	1716-0627-MX	NEKXM1	Neck Moment X	Rt Ear	282.90624	N·m	- 3/10/2003	OK 065nlr	Denton	1716
6011	1716-0627-MY	NEKYM1	Neck Moment Y	Chn	282.62862	N·m	+ 3/10/2003	OK 065nlr	Denton	1716
6012	1716-0627-MZ	NEKZM1	Neck Moment Z	Chn	282.46679	N·m	+ 3/10/2003	OK 065nlr	Denton	1716
6013	P25068	LURYG1	Left Upper Rib Y	Rgt	804.05798	g	+ 12/19/2002	OK 065nlr	Endevco	7264C-2K-2-180
6014	P25067	LURYR1	Left Upper Rib Red Y	Rgt	808.88509	g	+ 12/19/2002	OK 065nlr	Endevco	7264C-2K-2-180
6015	P25389	LLRYG1	Left Lower Rib Y	Rgt	799.52528	g	+ 12/19/2002	OK 065nlr	Endevco	7264C-2K-2-180
6016	P25395	LLRYR1	Left Lower Rib Red Y	Rgt	788.95463	g	+ 12/19/2002	OK 065nlr	Endevco	7264C-2K-2-180
6017	P14826	T12YG1	Lower Spine Y	Lft	401.80813	g	- 12/19/2002	OK 065nlr	Endevco	7264C-2K-2-180
6018	P25069	T12YR1	Lower Spine Red Y	Lft	398.15851	g	- 12/19/2002	OK 065nlr	Endevco	7264C-2K-2-180
6019	P25397	PEVYG1	Pelvis Accel Y	Lft	400.34404	g	- 12/19/2002	OK 065nlr	Endevco	7264C-2K-2-180
6020	P25061	PEVYR1	Pelvis Accel Red Y	Lft	401.07161	g	- 12/19/2002	OK 065nlr	Endevco	7264C-2K-2-180
6021	J26980	HEDXG4	Head Accel X	Rwd	790.56265	g	- 3/11/2003	OK 066nlr	Endevco	7264-2000TZ
6022	J27048	HEDYG4	Head Accel Y	Lft	800.20005	g	- 3/11/2003	OK 066nlr	Endevco	7264-2000TZ
6024	J26896	HEDZG4	Head Accel Z	Up	788.48078	g	- 3/11/2003	OK 066nlr	Endevco	7264-2000TZ
6025	P22890	HEDXR4	Head Accel X Red	Rwd	796.35419	g	- 3/11/2003	OK 066nlr	Endevco	7264C-2K-2-180
6026	P16213	HEDYR4	Head Accel Y Red	Lt	805.41135	g	- 3/11/2003	OK 066nlr	Endevco	7264C-2K-2-180
6027	P18941	HEDZR4	Head Accel Z Red	Up	808.42530	g	- 3/11/2003	OK 066nlr	Endevco	7264C-2K-2-180
6028	1716A-1220-FX	NEKXF4	Neck Force X	Hd	8898.1070	N	- 3/10/2003	OK 066nlr	Denton	1716A
6029	1716A-1220-FY	NEKYF4	Neck Force Y	Hd	8909.1398	N	+ 3/10/2003	OK 066nlr	Denton	1716A
6030	1716A-1220-FZ	NEKZF4	Neck Force Z	Hd	13367.953	N	+ 3/10/2003	OK 066nlr	Denton	1716A
6031	1716A-1220-MX	NEKXM4	Neck Moment X	Rt Ear	283.36569	N·m	- 3/10/2003	OK 066nlr	Denton	1716A
6032	1716A-1220-MY	NEKYM4	Neck Moment Y	Chn	283.17739	N·m	+ 3/10/2003	OK 066nlr	Denton	1716A

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Channel Report

4/22/2003 8:06:10 AM

Name of Test 030422-1

System MINIDAU

Name of DAU DAU7

Chan.#	Sensor #	Mnemonic	Description	Dir.	Range	Pol.	Cal.	Group	Mfg.	Model
7001	1716A-1220-MZ	NEKZM4	Neck Moment Z	Chn	282.90480	N-m	+ 3/10/2003	OK 066nlr	Denton	1716A
7002	P24511	LURYG4	Left Upper Rib Y	Rgt	799.87501	g	+ 11/21/2002	OK 066nlr	Endevco	7264C-2K-2-180
7003	P21652	LURYR4	Left Upper Rib Red Y	Rgt	803.23805	g	+ 11/21/2002	OK 066nlr	Endevco	7264C-2K-2-180
7004	P24508	LLRYG4	Left Lower Rib Y	Rgt	803.12465	g	+ 11/21/2002	OK 066nlr	Endevco	7264C-2K-2-180
7005	P24627	LLRYR4	Left Lower Rib Red Y	Rgt	801.56555	g	+ 11/21/2002	OK 066nlr	Endevco	7264C-2K-2-180
7006	P21635	T12YG4	Lower Spine Y	Lft	401.99742	g	- 11/21/2002	OK 066nlr	Endevco	7264C-2K-2-180
7007	P24564	T12YR4	Lower Spine Red Y	Lft	401.56862	g	- 11/21/2002	OK 066nlr	Endevco	7264C-2K-2-180
7008	P24393	PEVYG4	Pelvis Accel Y	Lft	401.26964	g	- 11/21/2002	OK 066nlr	Endevco	7264C-2K-2-180
7009	P24559	PEVYR4	Pelvis Accel Red Y	Lft	402.26272	g	- 11/21/2002	OK 066nlr	Endevco	7264C-2K-2-180
7010	J34122	RFSXG1	RGT SIDE SILL FRNT ST X	FWD	401.60012	g	+ 3/4/2003	OK -1	Endevco	7264-2000TZ
7011	P25809	RFSYG1	RGT SIDE SILL FRNT ST Y	LT	973.12502	g	- 3/20/2003	OK -1	Endevco	7264C-2K-2-180
7012	J17893	RFSZG1	RGT SIDE SILL FRNT ST Z	UP	403.18135	g	- 3/6/2003	OK -1	Endevco	7264-2000TZ
7013	J33395	RRSXG1	RGT SIDE SILL RR ST X	FWD	401.88383	g	+ 3/4/2003	OK -1	Endevco	7264-2000TZ
7014	P25393	RRSYG1	RGT SIDE SILL RR ST Y	LT	1001.5649	g	- 1/7/2003	OK -1	Endevco	7264C-2K-2-180
7015	P23186	RRSZG1	RGT SIDE SILL RR ST Z	UP	402.85777	g	- 3/3/2003	OK -1	Endevco	7264C-2K-2-180
7016	03C03C14-N15	RDKXG1	RR FLRPAN ABV AXLE X	FWD	1003.9215	g	+ 3/21/2003	OK -1	Entran	EGE-73B6Q-200
7017	03C03C14-F12	RDKYG1	RR FLRPAN ABV AXLE Y	LT	980.65504	g	- 3/27/2003	OK -1	Entran	EGE-73B6Q-200
7018	03C03C14-F14	RDKZG1	RR FLRPAN ABV AXLE Z	UP	1016.2763	g	- 3/27/2003	OK -1	Entran	EGE-73B6Q-200
7019	03D03C27-N09	LRSYG1	LFT SIDE SILL RR ST Y	RT	1013.8613	g	+ 4/3/2003	OK -1	Entran	EGE-73B6Q-200
7020	03D03C27-N13	LFSYG1	LFT SIDE SILL FRNT ST Y	RT	989.37198	g	+ 4/3/2003	OK -1	Entran	EGE-73B6Q-200
7021	P23459	RRTYG1	RGT RR OCP COMP Y	RT	1491.1463	g	+ 3/3/2003	OK -1	Endevco	7264C-2K-2-180
7022	03C03C14-N02	LLBYG1	LFT LOWER B-POST Y	RT	1544.4947	g	+ 3/24/2003	OK -1	Entran	EGE-73B6Q-200
7023	03C03C14-N18	LUBYG1	LFT MID B-POST Y	RT	1538.4615	g	+ 3/21/2003	OK -1	Entran	EGE-73B6Q-200
7024	03D03C28-N06	LLAYG1	LFT LOWER A-POST Y	LT	1516.5876	g	- 4/4/2003	OK -1	Entran	EGE-73B6Q-200
7025	03D03C28-N15	LUAYG1	LFT MID A-POST Y	LT	1462.0217	g	- 4/4/2003	OK -1	Entran	EGE-73B6Q-200
7026	03D03C27-N01	LFTYG1	LFT FRNT ST TRK Y	RT	1458.6894	g	+ 4/3/2003	OK -1	Entran	EGE-73B6Q-200
7027	03D03C27-N17	LRTYG1	LFT RR ST TR Y	RT	1545.8937	g	+ 4/3/2003	OK -1	Entran	EGE-73B6Q-200
7028	03D03C27-N26	VCGXG1	VEH C/G X	FWD	1006.2893	g	+ 4/3/2003	OK -1	Entran	EGE-73B6Q-200
7029	03D03C27-N18	VCGYG1	VEH C/G Y	RT	1020.7336	g	+ 4/3/2003	OK -1	Entran	EGE-73B6Q-200
7030	03D03C27-N22	VCGZG1	VEH C/G Z	UP	989.37198	g	- 4/3/2003	OK -1	Entran	EGE-73B6Q-200

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Channel Report

4/22/2003 8:06:10 AM

Name of Test		System		MINIDAU		Name of DAU		DAU9		
Chan.#	Sensor #	Mnemonic	Description	Dir.	Range	Pol.	Cal.	Group	Mfg.	Model
9001	EVENT	EVENT	EVENT		5.12	V	+ 10/15/2002	OK -1	TRC	Event
9002	03D03C28-N13	BCGXG1	MDB CG X-AXIS	FWD	603.77358	g	+ 4/3/2003	OK -1	Entran	EGE-73B6Q-200
9003	03D03C27-N25	BCGYG1	MDB CG Y-AXIS	RT	606.63507	g	+ 4/3/2003	OK -1	Entran	EGE-73B6Q-200
9004	03C03C14-N25	BCGZG1	MDB CG Z-AXIA	UP	601.50375	g	- 3/21/2003	OK -1	Entran	EGE-73B6Q-200
9005	03C03C14-N27	LRRXG1	MDB LT RR X-AXIS	FWD	600.37523	g	+ 3/24/2003	OK -1	Entran	EGE-73B6Q-200
9006	P25516	LRRYG1	MDB LT RR Y-AXIS	LT	598.93548	g	- 3/4/2003	OK -1	Endevco	7264C-2K-2-180

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Digital and System Channel Report

2003-04-22 08:05:58

Name of Test 030422-1

System MINIDAU

Name of DAU DAU9 descriptio

enable Channel Short Name
Yes 9501 DIG9

Type
dig0

Data File Module Type
DAT99501 KM3710 Controller

bit position	bit	short	long	descriptio
MSB = bit 15	1	MDBR1	MDB RT SIDE CONTACT SWITCH	4
bit 14	1	MDBL1	MDB LT SIDE CONTACT SWITCH	5
bit 13	0			
bit 12	0			
bit 11	0			
bit 10	0			
bit 09	0			
bit 08	0			
bit 07	0			
bit 06	0			
bit 05	0			
bit 04	0			
bit 03	0			
bit 02	0			
bit 01	0			
LSB = bit 00	0			

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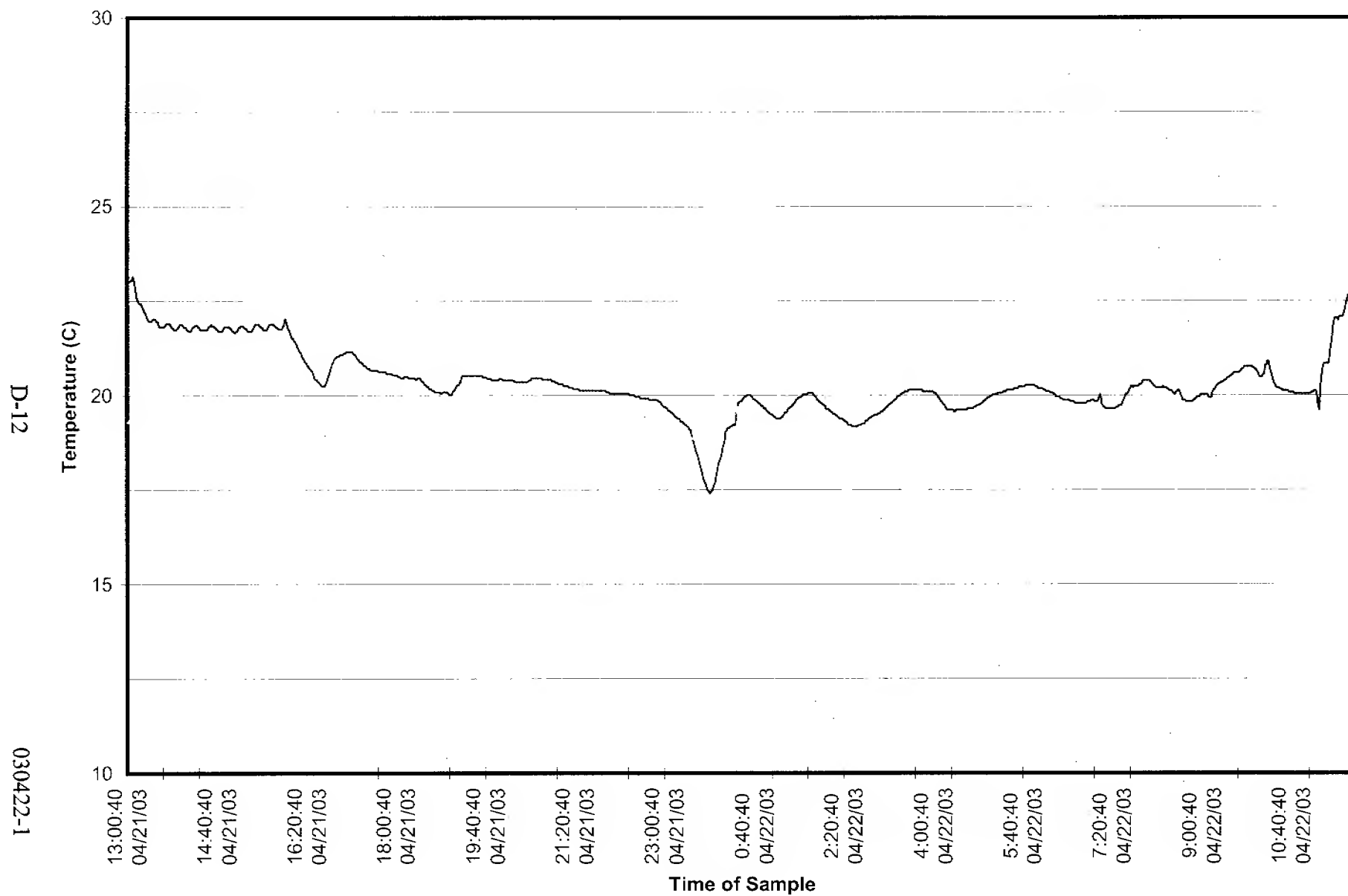
Dummy	065nlr	Type	SID	Descriptio	NHTSA - 065n SID-LEFT IMP.W/ RED ACCELS. CAL DUE 6-19-03 (DKS 3-11-03)J211						
Chsnam	Location	Model	Name	Manufacturer	Sens./mV/V/		Fullscal	Caldat	Pos Output	Flip	
HEDXG	Head Accel X	7264-2000TZ	J27271	Endevco	0.03198	g	2000	3/11/2003	Rwd	1	
HEDYG	Head Accel Y	7264-2000TZ	J27352	Endevco	0.0239	g	2000	3/11/2003	Lft	1	
HEDZG	Head Accel Z	7264-2000TZ	J27283	Endevco	0.02343	g	2000	3/11/2003	Up	1	
HEDXR	Head Accel X Red	7264-2000TZ	J29134	Endevco	0.02804	g	2000	3/11/2003	Rwd	1	
HEDYR	Head Accel Y Red	7264-2000TZ	J29020	Endevco	0.02279	g	2000	3/11/2003	Lt	1	
HEDZR	Head Accel Z Red	7264-2000TZ	J27322	Endevco	0.02419	g	2000	3/11/2003	Up	1	
NEKXF	Neck Force X	1716	1716-0627-FX	Denton	0.000191111	N	8896.4	3/10/2003	Hd Fd,Cst Rr	1	
NEKYF	Neck Force Y	1716	1716-0627-FY	Denton	0.000188514	N	8896.4	3/10/2003	Hd Lt,Cst Rt	0	
NEKZF	Neck Force Z	1716	1716-0627-FZ	Denton	0.000085345	N	13344.6	3/10/2003	Hd Up,Cst Dn	0	
NEKXM	Neck Moment X	1716	1716-0627-MX	Denton	0.005914336	N	282.5	3/10/2003	Rt Ear to Rt Shld	1	
NEKYM	Neck Moment Y	1716	1716-0627-MY	Denton	0.005978761	N	282.5	3/10/2003	Chn to Strmn	0	
NEKZM	Neck Moment Z	1716	1716-0627-MZ	Denton	0.00831469	N	282.5	3/10/2003	Chn to Lt Shld	0	
LURYG	Left Upper Rib Y	7264C-2K-2-18	P25068	Endevco	0.01721	g	2000	12/19/2002	Rgt	0	
LURYR	Left Upper Rib Red Y	7264C-2K-2-18	P25067	Endevco	0.01623	g	2000	12/19/2002	Rgt	0	
LLRYG	Left Lower Rib Y	7264C-2K-2-18	P25389	Endevco	0.01642	g	2000	12/19/2002	Rgt	0	
LLRYR	Left Lower Rib Red Y	7264C-2K-2-18	P25395	Endevco	0.02028	g	2000	12/19/2002	Rgt	0	
T12YG	Lower Spine Y	7264C-2K-2-18	P14826	Endevco	0.01991	g	2000	12/19/2002	Lft	1	
T12YR	Lower Spine Red Y	7264C-2K-2-18	P25069	Endevco	0.01692	g	2000	12/19/2002	Lft	1	
PEVYG	Pelvis Accel Y	7264C-2K-2-18	P25397	Endevco	0.01827	g	2000	12/19/2002	Lft	1	
PEVYR	Pelvis Accel Red Y	7264C-2K-2-18	P25061	Endevco	0.01798	g	2000	12/19/2002	Lft	1	

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Dummy	066nlr	Type	SID	Description	NHTSA - 066n SID-LEFT IMP.W/ RED ACCELS CAL DUE 5-21-03(DKS 3-12-03)J211						
Chsnam	Location	Model	Name	Manufacturer	Sens./mV/V/	Fullscal	Caldat	Pos Output	Flip		
HEDXG	Head Accel X	7264-2000TZ	J26980	Endevco	0.03084 g	2000	3/11/2003	Rwd	1		
HEDYG	Head Accel Y	7264-2000TZ	J27048	Endevco	0.02666 g	2000	3/11/2003	Lft	1		
HEDZG	Head Accel Z	7264-2000TZ	J26896	Endevco	0.02405 g	2000	3/11/2003	Up	1		
HEDXR	Head Accel X Red	7264C-2K-2-18	P22890	Endevco	0.02217 g	2000	3/11/2003	Rwd	1		
HEDYR	Head Accel Y Red	7264C-2K-2-18	P16213	Endevco	0.0163 g	2000	3/11/2003	Lt	1		
HEDZR	Head Accel Z Red	7264C-2K-2-18	P18941	Endevco	0.02043 g	2000	3/11/2003	Up	1		
NEKXF	Neck Force X	1716A	1716A-1220-FX	Denton	0.000194393 N	8896.4	3/10/2003	Hd Fd,Cst Rr	1		
NEKYF	Neck Force Y	1716A	1716A-1220-FY	Denton	0.000189043 N	8896.4	3/10/2003	Hd Lt,Cst Rt	0		
NEKZF	Neck Force Z	1716A	1716A-1220-FZ	Denton	0.000098459 N	13344.6	3/10/2003	Hd Up,Cst Dn	0		
NEKXM	Neck Moment X	1716A	1716A-1220-MX	Denton	0.006002832 N	282.5	3/10/2003	Rt Ear to Rt Shld	1		
NEKYM	Neck Moment Y	1716A	1716A-1220-MY	Denton	0.005908673 N	282.5	3/10/2003	Chn to Strmm	0		
NEKZM	Neck Moment Z	1716A	1716A-1220-MZ	Denton	0.008456991 N	282.5	3/10/2003	Chn to Lt Shld	0		
LURYG	Left Upper Rib Y	7264C-2K-2-18	P24511	Endevco	0.0173 g	2000	11/21/2002	Rgt	0		
LURYR	Left Upper Rib Red Y	7264C-2K-2-18	P21652	Endevco	0.02198 g	2000	11/21/2002	Rgt	0		
LLRYG	Left Lower Rib Y	7264C-2K-2-18	P24508	Endevco	0.01723 g	2000	11/21/2002	Rgt	0		
LLRYR	Left Lower Rib Red Y	7264C-2K-2-18	P24627	Endevco	0.01825 g	2000	11/21/2002	Rgt	0		
T12YG	Lower Spine Y	7264C-2K-2-18	P21635	Endevco	0.01873 g	2000	11/21/2002	Lft	1		
T12YR	Lower Spine Red Y	7264C-2K-2-18	P24564	Endevco	0.01875 g	2000	11/21/2002	Lft	1		
PEVYG	Pelvis Accel Y	7264C-2K-2-18	P24393	Endevco	0.01963 g	2000	11/21/2002	Lft	1		
PEVYR	Pelvis Accel Red Y	7264C-2K-2-18	P24559	Endevco	0.0172 g	2000	11/21/2002	Lft	1		

C40100/SIDE IMPACT OF 2004 GRAND PRIX GT





SIDE IMPACTOR BARRIER CERTIFICATION

Date: April 1, 2003
To: Transportation Research
Ship & Rec Bldg 50
10820 St. Route 347
East Liberty, OH 43319-0367

PURCHASE ORDER INFORMATION

Customer P.O. Number: 22964
Work Order Number: 16444
Quantity: 01 piece

CORE INFORMATION

Core Type: PCGA-1/4-5.2-P-3003-T
Measured Cell Size: 0.250 inches
Measured Density: 5.2 pcf

Unit Number: 013C0203

This is to certify that the aluminum honeycomb core supplied, under the unit number provided, meets the crush requirements of 232 – 250 psi as per DWG# DSL-1285.


Quality Control Representative
Karl D. Zwaanstra

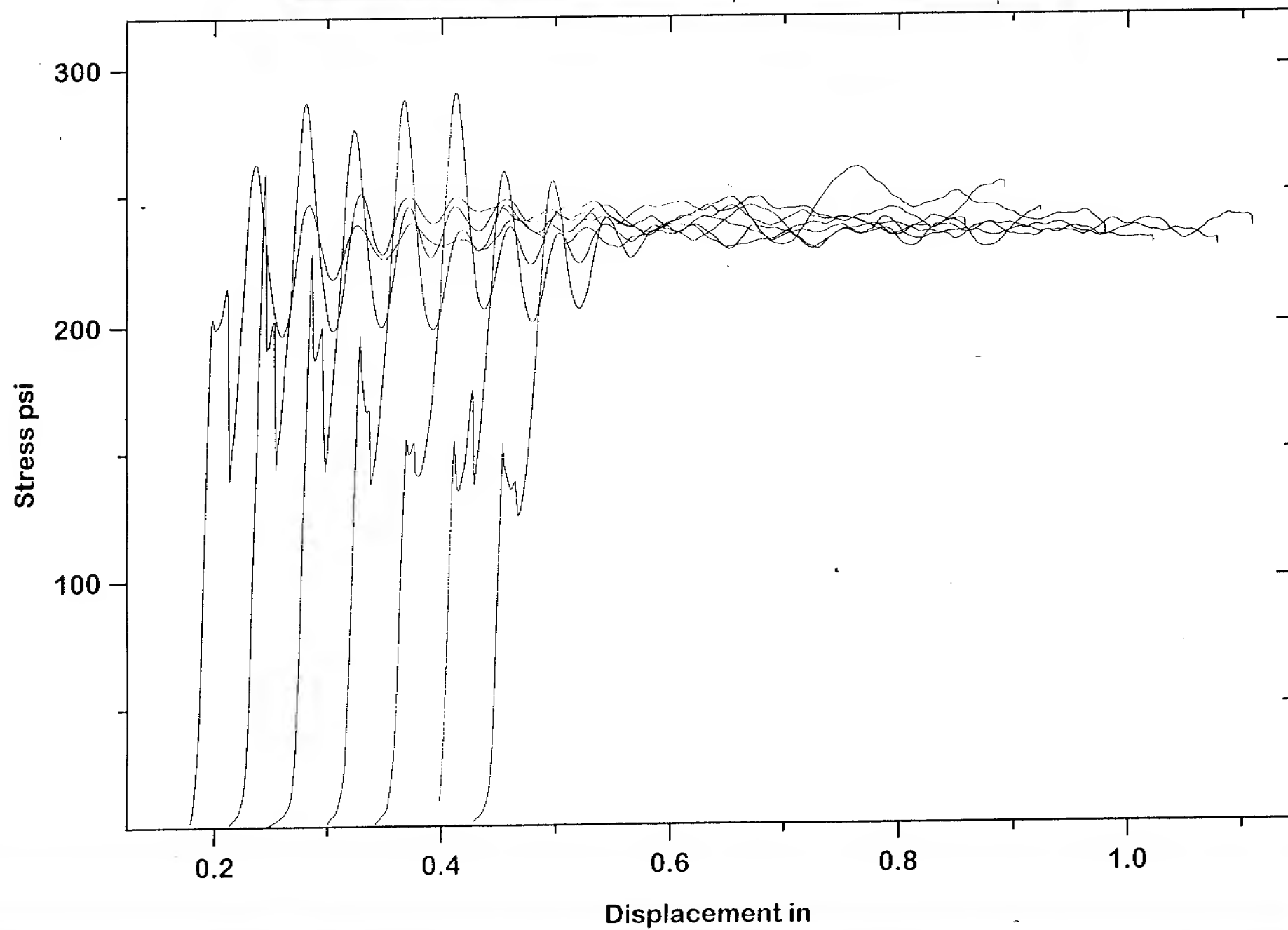


Crush Data
232 - 250 psi per DWG # DSL-1285

Block Number: 013C0203

<u>Specimen Number</u>	<u>Zone 1</u>	<u>Zone 2</u>	<u>Zone 3</u>
1	233.48	233.35	237.86
2	242.12	244.14	240.86
3	240.11	239.69	235.51
4	239.95	247.24	244.81
5	236.72	235.46	235.51
6	233.23	233.94	234.72
7	235.06	233.80	236.57

BLOCK # 013C0203 Sample ID: IN226629





SIDE IMPACTOR BARRIER CERTIFICATION

Date: April 1, 2003
To: Transportation Research
Ship & Rec Bldg 50
10820 St. Route 347
East Liberty, OH 43319-0367

PURCHASE ORDER INFORMATION


Customer P.O. Number: 22964
Work Order Number: 16444
Quantity: 01 piece

CORE INFORMATION

Core Type: PAMG-3/8-1.6-001-P-5052-T
Measured Cell Size: 0.375 inches
Measured Density: 1.6 pcf

Unit Number: 017A0303

This is to certify that the aluminum honeycomb core supplied, under the unit number provided, meets the crush requirements of 45 psi +/- 2.5 psi as per DWG# DSL-1285.


Quality Control Representative
Karl D. Zwaanstra

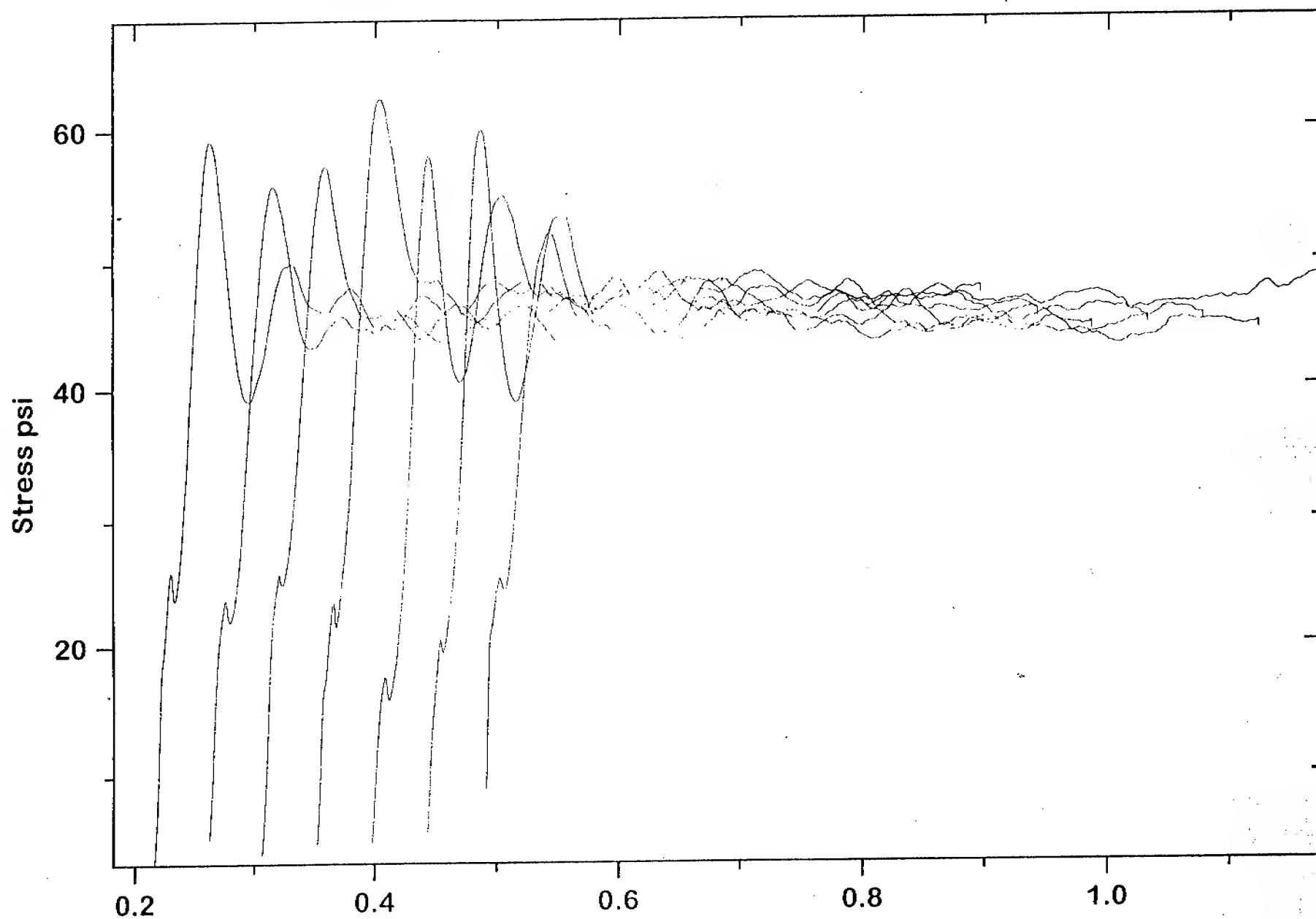


Crush Data
45 psi +/- 2.5 psi per DWG # DSL-1285

Block Number: 017A0303

<u>Specimen Number</u>	<u>Zone 1</u>	<u>Zone 2</u>	<u>Zone 3</u>
1	47.36	47.37	46.10
2	45.92	46.01	45.65
3	44.49	45.21	44.80
4	47.04	47.15	46.28
5	47.27	46.64	46.10
6	45.56	45.16	43.98
7	46.96	47.04	46.54

BLOCK # 017A0303 Sample ID: IN226932



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030422-1

Displacement in